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OFFICE OF STRATEGIC SERVICES

Research and Analysis Branch

R & A No. 2959

THE FOOD POSITION OF JAPAN

Description

An analysis of domestic production, trade, carry-over, and utilization of food in 1943-1944; including a detailed study of per capita consumption of fourteen principal consumer groups, and an analysis of the nutritional value of the diet of each group. A description of changes in 1944-1945 and a discussion of prospects for 1945-1946.

1 April 1945

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Errata:

Table 1, p. 5, line 12, "Sugar" should read:

column 1: 152[1] instead of 202

column 3: 1102 instead of 1152

column 7: 89 instead of 67

column 9: 85 instead of 81

Table 2, p. 6, replace "Cane Sugar" column:

	Sugar (000 mt.)
JAPAN TOTAL	136[2]
Okinawa	83
Kagoshima	15
Hokkaido	36
Others	2

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[1] 112,000 metric tons of cane sugar and 40,000 metric tons of beet sugar.

[2] 100,000 metric tons of cane sugar and 36,000 metric tons of beet sugar.

SUMMARY

Before the war, as now, Japan's food economy was characterized by intensive production of high-yielding crops, minimum waste in distribution, and a level of consumption low in comparison with western countries, both in quantity and in quality. Only in this way have the islands been able to achieve near self-sufficiency in food for their large and rapidly expanding population. Even before the war nearly one-fifth of food supplies were obtained from Japan's colonies.

The war led to a further tightening of Japan's food supply. By 1943, food production in terms of original food energy had declined by about five percent compared with the high level reached in the late 1930's. Imports, after rising to a peak in 1941 and 1942, had fallen a little below the pre-war level in the crop year 1943-44. In 1944, total production decreased by an additional three percent, while 1944-45 imports are expected to be about twenty-five percent lower than pre-war. The total supply for 1945 will thus be at least ten percent below prewar.

Efforts were made to counteract the gradual deterioration of Japan's supply position by an even more careful husbanding of the available resources. To cover essential food requirements, rice polishing was reduced and saké manufacture and other non-food uses were drastically curtailed. Thus, in 1943-44 the ultimate food energy derivable from production and imports was almost equal to pre-war. Even in 1944-45 it will be around ninety-four percent of the pre-war total. Differential rationing was introduced to assure the equitable distribution of supplies according to physiological need.

In spite of these measures, the average caloric intake was reduced by about ten percent, from 2270 calories per capita per day in the late 1930's to 2050 calories in 1944. At the same time, the quality of the diet -- always characterized by extreme frugality -- deteriorated further. Starchy foods have become even more preponderant than before the war, and the fat deficiency has been further aggravated. Rice contributes more than one-half of the total food energy, other grains about ten percent, sweet potatoes and Irish potatoes about eight percent, and soybeans and other beans seven percent. Fish, the only important source of animal protein, has become very scarce and contributes less than three percent of the food energy. Sugar consumption declined by forty percent, and was further cut in 1945. Except for sugar, 1945 rations are approximately unchanged compared with 1944.

The figures mentioned above are national averages. Food consumption, however, varies according to age, sex and degree of physical activity; and there are some regional dietary variations within each consumer group.

The ten percent curtailment of consumption was not dictated by an immediate emergency. With the savings afforded by the reduction in polishing and other forms of waste, production and imports in 1943-44 could have supported a consumption level only two percent below pre-war. The conclusion which suggests itself is that rations were cut down to a bare minimum, and Japan's food self-sufficiency was increased from eighty to nearly ninety percent, in order to build up and maintain reserves in the expectation of an Allied blockade.

The early expansion of reserve stocks was greatly aided by the 1941 and 1942 imports and by an excellent rice crop in 1942. With nationwide

rationing of rice instituted early in 1942, expansion of reserves continued through the harvest of 1943. Because 1944 crops provided only eighty-five percent of requirements in 1944-45 and because imports have continued to decline, the carryover into this year's harvest will probably be not much larger than it was a year ago.

It is estimated, however, that excess stocks before this autumn's crop will equal about 1.6 times the estimated annual deficit at prospective 1945 production levels, assuming an average daily per capita intake in the future of 2000 calories. In other words, it appears that Japan could withstand an effective blockade for almost two years with only a slight decline in consumption below present levels. A somewhat greater reduction of consumption would make it possible for Japan to bridge two harvests.

It should be kept in mind, however, that the estimate of stocks is subject to a large cumulative error. "Excess stocks" may actually be much smaller. Furthermore, Japan's agriculture is exceptionally vulnerable because of its great dependence upon a large input of nitrogenous fertilizer. If nitrogen production or distribution has been significantly disrupted before this year's plantings, yields in 1945 might decline by more than five percent. Stocks may be lost by spoilage and bombing. Transportation and distribution may deteriorate further so that the food supply in the cities may decline while stocks are hoarded in the country. The deterioration of wartime controls and the fear of inflation may cause farmers to refuse to market their produce through legal channels and at legal prices. They may be inclined, instead, to increase their own consumption, to hoard surpluses

over farm requirements, and to sell or barter food at black market prices. The European experience in World War II has shown that such developments may lead to widespread starvation among some groups of the population while other groups are comparatively well fed.

THE FOOD POSITION OF JAPAN

I. INTRODUCTION

Despite the rapid industrialization of Japan during the past few decades, agriculture remains the principal industry of the Japanese. On as little as 15,000,000 acres of land, it provides employment to two-fifths of the islands' working population of 32,800,000. Only sixteen percent of the total area of Japan is cultivated, further expansion being limited by the mountainous character of the country.

Thus the acreage of available land is small in relation to Japan's large and rapidly growing population. If, nevertheless, Japan has been able to approach self-sufficiency in food (before the war only twenty percent of the total caloric requirements was imported), it has been due to the intensive application of labor and fertilizer, and the almost exclusive use of crops for direct human consumption. In the regions favored by a mild and wet climate, painstaking practices of irrigation and transplanting enable the Japanese farmer to harvest either two crops of rice each year or a crop of some other grain in addition to a crop of rice. Furthermore, the lavish use of natural and chemical fertilizer raises average yields per acre to levels unequalled in any other country. Livestock is practically unknown, so that little food energy is wasted by converting crops to meat and dairy products.[1/]

[1.] The ultimate food energy obtained from an acre of land devoted to the production of livestock feed is only ten to thirty percent of the food energy which can be obtained from the same unit of land devoted to the production of crops for direct human consumption.

Waste of food in processing and distribution is kept to a minimum. As a result of all these factors, the productivity, in terms of ultimate food energy, of an acre in Japan is about nine times as high as that of an acre in the United States.[1]

Needless to say, this high degree of self-sufficiency is possible only with a diet of low quality, consisting largely of starchy staple foods such as rice, other cereals, Irish potatoes and sweet potatoes. Before the war rice contributed more than one-half of the total food energy, other grains about ten percent, sweet potatoes and Irish potatoes seven to eight percent. Fish, the only important source of animal protein, contributed about four percent of the food energy.

The principal imports are rice (about twenty percent of home production), sugar (about six times as much as domestic production), and soybeans (150 percent of production). See Table 1.

By 1943, wartime shortages of manpower and fertilizer had resulted in a decline of more than five percent in agricultural production compared with the high level reached in the late 1930's.[2] Imports rose to a peak in 1941 and 1942, but have since declined reaching about the pre-war level in 1943-44. To cover essential food requirements rice polishing was reduced

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[1] Before the war, Japan produced about 1840 calories per capita per day, or somewhat over 130 billion calories per day, on 15,000,000 acres of cultivated land. In the United States, 3080 calories per capita per day, or 400 billion calories per day were produced on 415 million acres of crop land. This is equivalent to 960 calories per day per acre, as compared with 8670 in Japan.

[2] In terms of original food energy produced domestically, the average of 1935, 1937 and 1939 is used as a base.

and the quantity of food diverted to non-food uses such as saké was drastically curtailed. In spite of these measures, the average caloric intake of the Japanese, as shown below in the analysis of rations and probable extra legal consumption, seems to have declined by about ten percent, from 2270 calories per capita per day in 1935-36, 1937-38, 1939-40, to 2050 calories in 1943-44. Part of the explanation for this reduction lies in the stockpiling program which the Japanese leaders imposed in expectation of an Allied blockade.

To insure the equitable distribution of the diminishing supply, delivery quotas were imposed on producers of rice and other staple foods, and the quantities collected were distributed through rations differentiated according to age, sex, and degree of physical activity.

II. PRODUCTION AND IMPORTS

The production and imports of major foodstuffs and total supplies, pre-war and 1943-44[1] are shown in Table 1. The geographical distribution of the principal crops is presented in Tables 2 and 3.

A. Production

Japan's 1943-44 domestic production of original food energy[2] is estimated to have declined by somewhat over five percent from the pre-war level. Declines were greatest in milk and dairy products, which have always been of minor importance in the Japanese diet. Production of sugar declined by about one-tenth; fruits and fish by one-fourth; and vegetables and grains other than rice by one-fifth. Rice production decreased by only two percent. Production increases took place in soybeans (+ 16 percent); other beans (+ 19 percent); sweet potatoes (+ 22 percent); and Irish potatoes (+ 26 percent).

Generally speaking, the distribution of the principal crops is quite homogeneous throughout Japan. There are some instances of geographic specialization, however, due largely to variations in climate. Hokkaido produces only four percent of the rice grown in Japan, but accounts for half of its potatoes, half of its dairy products, almost all of its livestock, two-fifths of its beans, one third of its fish, and one-fourth of its sugar production. The prefectures in Kyushu and Shikoku, facing the ocean, most nearly approximate a tropical climate. Kyushu produces more than one-third of Japan's sweet potatoes, and Kyushu's southernmost prefecture of Kagoshima (which includes part of the Ryukyu Islands) accounts for about one-tenth of the

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[1] 1943-44 crop year, beginning in the fall of 1943.

[2] Original food energy is the energy which agriculture would provide if all crops were used exclusively as food.

Table 1. PRODUCTION AND MAJOR IMPORTS OF FOODSTUFFS IN JAPAN
COMPARISON OF 1935/36, 1937/38, 1939/40 AVERAGE WITH 1943/44
(000 metric tons)

	Average 1935/36, 1937/38, 1939/40[1]			Estimates 1943/44			1943/44 as Percentage of Average 1935, '37, '39		
	Production	Imports	Total Supply	Production	Imports	Total Supply	Production	Imports	Total Supply
Rice	9,396	1,879	11,275	9,197[2]	1,750	10,947	98	93	97
Wheat	1,430		1,430	1,113[3]	50	1,163	78		81
Barley	790		790	587[3]		587	74		74
Naked Barley	695		695	687[3]		687	99		98
Minor Grains	272		272	240		240	88		88
Soybeans	344	516	860	400	920	1,320	116	178	153
Other Beans	241	193	434	289[4]	225	514	120	117	118
Sweet Potatoes	3,606		3,606	4,400		4,400	122		122
Irish Potatoes	1,603		1,603	2,025[5]		2,025	126		126
Vegetables	6,829		6,829	5,500[6]		5,500	81		81
Fruits	1,292		1,292	1,000		1,000	77		77
Sugar	202	950	1,152	136[7]	800	936	67	84	81
Fish	2,970	297	3,267	2,210[8]	200	2,410	74	67	74
Meat	135		135	125		125	93		93
Eggs	201		201	206[7]		206	102		102
Milk	255		255	132		132	52		52
Dairy Products	33		33	20		20	61		61

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1. For sources see Appendix A.
2. Tokyo broadcast to home audience, 14 March 1944.
3. Tokyo Domei broadcast, 12 November 1943.
4. Assuming an increase of 20 percent over pre-war production.
5. Europa Kabel, 14 July 1944.
6. Assuming a decrease of about 20 percent from pre-war production.
7. Civil Affairs Handbook, Japan, Section 7: Agriculture, p. 137 and FEA: "Japan's War Economy", 1943-44, p. 187 (EF-60.1).
8. Assuming a decrease of 25 percent from 1939 catch.

Table 2. ESTIMATED PRODUCTION OF MAJOR FOODSTUFFS IN JAPAN, 1943-1944,[1]/
BY REGIONS AND PREFECTURES[2]/
(1000 metric tons)

	Rice	Wheat	Barley	Naked Barley	Minor Grains	Soybeans	Other Beans	Sweet Potatoes	Irish Potatoes	Vegetables	Fruits	Cane Sugar	Fish	Meat	Eggs	Milk	Dairy Products
JAPAN TOTAL	9,197	1,113	587	687	240	400	289	4,400	2,025	5,500	1,000	136[3]/	2,210	125	206	132	20
Okinawa	18	1	2	1	1	5	2	682	--	22	1		2	3	0.4	0.1	--
Kyushu	1,352	248	18	237	66	57	31	1,509	101	786	127	123	336	11	27	5	0.3
Kagoshima	184	32	3	26	27	17	3	682	12	160	22	118	49	2	6	1	0.1
Miyazaki	129	14	2	18	6	7	2	193	4	104	9	1	24	1	3	0.3	--
Kumamoto	257	48	2	64	22	12	7	207	10	132	21	3	16	1	4	0.5	0.1
Oita	184	29	2	38	3	4	3	53	6	77	26	0	13	1	3	0.4	0
Fukuoka	322	74	3	31	2	2	7	31	33	148	23	1	64	3	7	2	--
Saga	193	32	3	14	0.1	3	6	35	8	50	12	0	11	1	2	0.7	0.1
Nagasaki	83	19	3	46	6	12	3	308	28	115	14	0.4	159	2	2	0.4	--
Shikoku	405	70	1	173	11	8	15	282	26	270	92	6	90	3	14	2	0.1
Kochi	92	3	--	14	3	1	2	84	2	50	7	1	31	0.5	2	0.3	--
Ehime	129	13	0.5	63	5	4	5	119	10	93	58	1	42	1	3	0.5	0
Tokushima	74	7	0.5	47	2	2	4	57	8	77	15	1	13	0.4	2	0.5	0.1
Kagawa	110	47	--	49	0.5	1	4	22	6	50	12	3	4	1	7	0.4	--
Chugoku	855	108	41	112	10	16	21	189	61	457	91	1	141	17	18	4	0.3
Yamaguchi	184	17	8	30	2	3	4	39	12	127	20	--	93	10	4	0.8	0
Hiroshima	184	4	10	45	3	4	6	79	21	154	39	0	9	5	6	1.7	0
Shimane	138	16	6	3	1	3	3	18	4	44	5	1	26	0.5	2	0.2	0
Okayama	248	3	13	28	3	5	5	35	18	88	21	0	4	1	5	1.4	0.3
Tottori	101	68	4	6	0.5	1	3	18	6	44	6	--	9	0.2	1	0.2	0
Kinki	1,104	91	29	93	3	19	27	101	79	649	195	1	97	29	22	21	1.8
Hyogo	285	53	6	47	1	6	6	22	22	154	13	0	26	6	7	9	1.1
Osaka	138	4	4	13	--	1	6	13	22	149	40	0.6	7	16	4	6	0.4
Wakayama	92	11	0.5	13	0.2	1	3	22	4	71	107	0	20	1	2	1	0.1
Nara	101	12	0.5	14	0.2	2	4	13	6	66	15	0.4	0.2	1	2	0.7	0
Kyoto	120	4	7	5	0.2	2	3	13	8	94	11	--	24	4	3	3	0
Fukui	156	1	2	0.1	1	4	2	9	11	44	6	--	18	0.4	1	0.7	0
Shiga	212	6	9	1	0.2	3	3	9	6	71	3	--	2	1	3	1	0.2
Tokaido	1,334	101	73	42	14	21	18	449	87	781	175	2	239	13	59	15	1.8
Ishikawa	184	1	3	0	1	5	3	22	10	50	11	--	64	1	1	1	0.1
Toyama	258	2	1	0	1	4	2	18	12	77	7	--	38	0.4	2	1	0.1
Gifu	202	19	17	2	4	4	3	40	10	82	10	0	1	1	4	1	--
Mie	202	12	6	20	1	3	3	48	6	104	14	0	35	1	7	2	0
Aichi	295	45	22	10	2	3	4	101	27	270	18	1.7	15	6	33	4	0.3
Shizuoka	193	22	24	10	5	2	3	220	22	198	115	0.6	86	4	12	6	1.3
Kanto	2,198	405	335	14	43	86	40	1,131	316	1,638	143	3	312	39	48	35	5.4
Nagano	221	27	21	0.2	6	14	5	9	35	143	19	--	1	2	5	1	0.
Yamanashi	64	13	15	0.3	3	2	2	13	18	49	13	--	0.2	1	2	1	0
Kanagawa	73	25	19	3	3	3	3	128	24	138	30	--	18	1	4	7	1
Tokyo	37	13	18	1	1	1	1	79	41	264	4	3	7	17	4	12	1.9
Saitama	221	70	64	1	4	9	4	154	53	192	12	--	0.2	8	5	2	--
Gumma	129	71	31	0.1	4	4	2	57	47	143	6	--	0.2	2	3	1	0
Chiba	331	43	44	3	5	13	10	374	12	204	14	--	77	3	10	6	2.5
Ibaraki	313	85	70	4	9	20	5	202	28	192	14	--	88	2	7	[illegible]	0
Tochigi	230	55	49	1	5	5	3	62	26	143	5	--	0.4	2	4	1	0
Niigata	579	3	4	0.1	3	15	5	53	32	170	26	--	20	1	4	1	0
Tohoku	1,536	58	86	3	50	103	18	57	251	627	150	--	263	5	12	5	0.4
Fukushima	285	17	26	0.2	5	16	4	25	51	132	23	--	62	1	4	1	0
Miyagi	285	12	31	1	1	17	2.5	13	51	110	7	--	66	1	3	1	0
Yamagata	313	2	2	0	1	8	2.5	9	22	99	10	--	4	0.8	1.4	2	0.2
Iwate	165	18	24	2	26	35	4	4	34	99	6	--	69	0.5	1.4	1	0.2
Akita	313	1	1	0	1	9	2.5	4	28	93.5	9	--	9	0.8	1.4	0.2	0.
Aomori	175	8	2	0	16	18	2.5	2	65	93.5	95	--	53	0.9	1	0.2	0
Hokkaido	395	31	2	12	42	85	117	0.1	1,104	270	26	--	730	5	6	45	9.9

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1. For sources of production estimates for Japan totals see Table I, Footnotes.
2. Estimates for Prefectures are based on percentage distribution observed in 1935, 1937 and 1939, adjusted for wartime changes.
3. Not including Okinawa.

Table 3. ESTIMATED PERCENTAGE DISTRIBUTION OF FOOD PRODUCTION, BY PREFECTURES, 1943-1944
BASED ON DATA FOR 1935, 1937 and 1939, ADJUSTED FOR WARTIME CHANGES

	Rice	Wheat	Barley	Naked Barley	Minor Grains	Soybeans	Other Beans	Sweet Potatoes	Irish Potatoes	Vegetables	Fruits	Cane Sugar [1]	Fish	Meat	Eggs	Milk	Dairy Products
JAPAN PROPER	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Okinawa	0.2	0.1	0.4	0.1	0.4	1.2	0.7	15.5	--	0.4	0.1	--	0.1	2.3	0.2	0.1	--
Kagoshima	2.0	2.9	0.5	3.8	11.26	4.3	1.0	15.5	0.6	2.9	2.2	86.9	2.2	1.8	3.1	0.6	0.4
Miyazaki	1.4	1.2	0.3	2.6	2.6	1.8	0.6	4.4	0.2	1.9	0.9	0.4	1.1	0.5	1.4	0.2	--
Kumamoto	2.8	4.3	0.4	9.4	8.9	2.9	2.4	4.7	0.5	2.4	2.1	2.0	0.7	1.1	1.7	0.4	0.3
Oita	2.0	2.6	0.3	5.5	1.3	1.0	1.2	1.2	0.3	1.4	2.6	0.0089	0.6	0.7	1.5	0.3	0.01
Fukuoka	3.5	6.6	0.5	4.5	0.8	0.6	2.3	0.7	1.6	2.7	2.3	0.4	2.9	2.9	3.2	1.6	--
Saga	2.1	2.9	0.5	2.0	0.004	0.8	2.1	0.8	0.4	0.9	1.2	0.0001	0.5	0.5	1.1	0.5	0.6
Nagasaki	0.9	1.7	0.6	6.7	2.5	2.9	1.2	7.0	1.4	2.1	1.4	0.3	7.2	1.5	1.1	0.3	--
Kochi	1.0	0.3	--	2.0	1.3	0.2	0.7	1.9	0.1	0.9	0.7	0.8	1.4	0.4	1.0	0.2	--
Ehime	1.4	1.2	0.1	9.2	2.1	1.0	1.7	2.7	0.5	1.7	5.8	0.7	1.9	0.6	1.6	0.4	0.003
Tokushima	0.8	0.6	0.1	6.8	1.1	0.5	1.3	1.3	0.4	1.4	1.5	0.7	0.6	0.3	0.9	0.4	0.3
Kagawa	1.2	4.2	--	7.2	0.2	0.4	1.6	0.5	0.3	0.9	1.2	2.3	0.2	0.7	3.3	0.3	--
Yamaguchi	2.0	1.5	1.3	4.4	0.9	0.7	1.3	0.9	0.6	2.3	2.0	--	4.2	7.8	2.2	0.6	0.02
Hiroshima	2.0	0.4	1.7	6.5	1.3	0.9	2.2	1.8	1.0	2.8	3.9	0.005	0.4	4.1	2.7	1.3	0.04
Shimane	1.5	1.4	1.1	0.5	0.6	0.7	1.1	0.4	0.2	0.8	0.5	0.455	1.2	0.4	0.9	0.2	0.01
Okayama	2.7	0.3	2.2	4.0	1.2	1.2	1.6	0.8	0.9	1.6	2.1	0.001	0.2	1.0	2.3	1.1	1.3
Tottori	1.1	6.1	0.6	0.9	0.2	0.4	1.0	0.4	0.3	0.8	0.6	--	0.4	0.2	0.5	0.2	0.02
Hyogo	3.1	4.7	1.1	6.8	0.3	1.5	2.1	0.5	1.1	2.8	1.3	0.1	1.2	5.0	3.3	6.9	5.5
Osaka	1.5	0.4	0.6	1.9	--	0.3	2.1	0.3	1.1	2.7	4.0	0.46	0.3	12.1	2.1	4.2	1.8
Wakayama	1.0	1.0	0.1	1.9	0.1	0.3	1.1	0.5	0.2	1.3	10.7	0.02	0.9	0.6	1.1	0.8	0.3
Nara	1.1	1.1	0.1	2.0	0.1	0.5	1.4	0.3	0.3	1.2	1.5	0.3	0.01	0.8	0.9	0.5	0.05
Kyoto	1.3	0.4	1.2	0.7	0.1	0.4	1.2	0.3	0.4	1.7	1.1	--	1.1	3.5	1.3	2.2	0.01
Fukui	1.7	0.1	0.3	0.01	0.5	0.9	0.5	0.2	0.5	0.8	0.6	--	0.8	0.3	0.6	0.5	0.001
Shiga	2.3	0.5	1.6	0.2	0.1	0.8	1.1	0.2	0.3	1.3	0.3	--	0.1	0.9	1.3	0.8	1.3
Ishikawa	2.0	0.1	0.6	0.002	0.6	1.3	1.0	0.5	0.5	0.9	1.1	--	2.9	0.6	0.7	0.9	0.7
Toyama	2.8	0.2	0.1	0.004	0.3	1.1	0.7	0.4	0.6	1.4	0.7	--	1.7	0.3	0.9	0.7	0.5
Gifu	2.2	1.7	2.9	0.3	1.6	1.0	0.9	0.9	0.5	1.5	1.0	0.04	0.03	0.9	2.0	0.7	--
Mie	2.2	1.1	1.1	2.9	0.3	0.7	1.2	1.1	0.3	1.9	1.4	0.01	1.6	0.8	3.4	1.3	0.09
Aichi	3.2	4.0	3.7	1.4	1.0	0.8	1.5	2.3	1.3	4.9	1.8	1.3	0.7	4.7	16.1	3.5	1.7
Shizuoka	2.1	2.0	4.1	1.5	1.9	0.5	1.1	5.0	1.1	3.6	11.5	0.5	3.88	2.8	5.8	4.3	6.7
Nagano	2.4	2.4	3.6	0.03	2.5	3.5	1.9	0.2	1.7	2.6	1.9	--	0.03	1.4	2.5	0.7	0.001
Yamanashi	0.7	1.2	2.5	0.04	1.1	0.5	0.6	0.3	0.9	0.9	1.3	--	0.01	0.7	0.9	0.4	0.001
Kanagawa	0.8	2.2	3.3	0.45	1.2	0.7	0.9	2.9	1.2	2.5	3.0	--	0.8	0.7	1.7	5.2	4.7
Tokyo	0.4	1.2	3.0	0.13	0.6	0.1	0.4	1.8	2.0	4.8	0.4	2.3	0.3	13.9	2.1	9.5	9.6
Saitama	2.4	6.3	10.9	0.14	1.6	2.3	1.5	3.5	2.6	3.5	1.2	--	0.01	6.5	2.5	1.5	--
Gumma	1.4	6.4	5.3	0.01	1.6	1.1	0.6	1.3	2.3	2.6	0.6	--	0.01	1.8	1.4	1.0	0.01
Chiba	3.6	3.9	7.4	0.46	2.1	3.2	3.3	8.5	0.6	3.7	1.4	--	8.0	2.5	5.1	6.0	12.5
Ibaraki	3.4	7.6	11.9	0.65	3.7	5.0	1.7	4.6	1.4	3.5	1.4	--	4.0	1.9	3.6	0.7	0.001
Tochigi	2.5	4.9	8.4	0.15	2.3	1.3	1.0	1.4	1.3	2.6	0.5	--	0.02	1.3	1.8	0.5	0.002
Niigata	6.3	0.3	0.6	0.02	1.3	3.7	1.6	1.2	1.6	3.1	2.6	--	0.9	1.1	1.9	0.9	0.01
Fukushima	3.1	1.5	4.4	0.031	1.8	3.9	1.3	0.6	2.5	2.4	2.3	--	2.8	0.8	1.8	0.6	0.2
Miyagi	3.1	1.1	5.4	0.1	0.4	4.3	0.9	0.3	2.5	2.0	0.7	--	3.0	0.8	1.2	0.7	0.001
Yamagata	3.4	0.2	0.3	0.001	0.6	2.0	0.9	0.2	1.1	1.8	1.0	--	0.2	0.6	0.7	1.1	0.9
Iwate	1.8	1.6	4.1	0.27	10.8	8.8	1.2	0.1	1.7	1.8	0.6	--	3.1	0.4	0.7	0.8	0.9
Akita	3.4	0.1	0.1	0.001	0.6	2.2	0.9	0.06	1.4	1.7	0.9	--	0.4	0.6	0.7	0.2	0.01
Aomori	1.9	0.7	0.3	0.001	6.5	4.6	0.9	0.037	3.2	1.7	9.5	--	2.4	0.7	0.5	0.2	0.01
Hokkaido	4.3	2.8	0.4	1.8	17.7	21.2	40.5	0.003	54.5	4.9	2.6	--	33.0	4.2	2.7	34.0	49.5

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[1] Not including Okinawa

sugar production in Japan proper, and Okinawa for over sixty percent. Kochi is the only prefecture where a second rice crop is grown regularly.

1. Rice. This basic staple of the Japanese diet is grown in the lowlands and plains of Japan, wherever irrigation is possible.[1] It occupies about 3.1 million hectares, or forty percent of the total crop acreage (double-cropped land being counted twice). But even so the quantity produced is far from sufficient to cover the requirements of the population. A normal pre-war crop in Japan Proper yielded about 9.4 million metric tons; the 1943 crop amounted to 9.2 million metric tons. Of this 2.2 million metric tons or almost one-fourth are produced in the Kanto administrative region, 1.5 million metric tons in the Tohoku region, about 1.3 million metric tons each in Kyushu and Tokaido, 1.1 million metric tons in Kinki, 850,000 metric tons in Chugoku; about 400,000 metric tons each in Shikoku and Hokkaido, and 18,000 metric tons in Okinawa. Significant surpluses of rice are produced in the prefectures of Niigata, Akita, Yamagata, Toyama, Shiga, Miyagi, and Saga, in that order. Rice is heavily fertilized and yields per acre are high; the consumption of nitrogeneous fertilizer per acre is greater than in any other country or for any other crop. Owing to an equable climate, yields in Southwestern Japan are higher and less variable than in the north.

2. Other grains. Wheat is grown either on upland farms or as a winter crop in paddy fields. In a normal year, about 3.2 million metric tons of wheat were produced in Japan; in 1943 the production amounted to only 1.1 million metric tons. Kanto accounts for about 400,000 metric tons or more than one-third of the total production. Kyushu produces 250,000 metric tons

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[1] Less than five percent of the total crop is grown on dry land.

and Chugoku, Tokaido and Kinki about 100,000 metric tons each.

Closely competing with wheat as upland crops or as winter crops on rice fields are barley and naked barley, of which about 1.5 million metric tons were normally grown in Japan. In 1943, the production amounted to about 1.3 million metric tons. More than seventy percent of the barley crop is produced in Kanto and Tohoku; whereas naked barley is mainly grown in the south. In addition, Japan normally produced about 270,000 metric tons of minor grains (buckwheat, millet, and corn). In 1943, production of these grains amounted to about 240,000 metric tons.

3. Soybeans and other beans. Soybeans and azuki beans are the principal legumes. In 1943 Japan produced about 400,000 metric tons of soybeans, almost seventy percent of which are grown in central and northern regions, with Tohoku accounting for more than twenty-five percent and Hokkaido and Kanto producing more than twenty percent each. The 1943 production of other beans amounts to somewhat less than 300,000 metric tons. Of this Hokkaido is estimated to have produced about 120,000 metric tons, or more than forty percent.

4. Sweet potatoes and Irish potatoes. Japan produced normally some 3.6 million metric tons of sweet potatoes, but the 1943 production was more than twenty percent above the pre-war level. Kyushu (including the northern Ryukyus) accounts for more than one-third of the total production. Irish potatoes are extensively grown in the northern part of the country. Total production in 1943 amounted to 2,025,000 metric tons. Hokkaido is by far the leading prefecture, producing more than fifty percent; Kanto and Tohoku account for sixteen and twelve percent respectively.

5. Fresh vegetables and fruits. In 1943 Japan produced about 5.5 million metric tons of fresh vegetables, including giant radishes, turnips, taro, watermelons, egg plants, pumpkins, cabbage, cucumber, carrots, musk melons, burdock and lotus roots. Total fruit production amounted to one million metric tons. The prefectures of Shizuoka, Wakayama and Aomori account for more than ten percent each of the total Japanese production of fruits, and the prefecture of Ehime for about six percent. Mandarin oranges, persimmons, apples, pears, and plums are the principal fruits grown.

6. Sugar. In 1943 Japan proper produced only about 136,000 metric tons of sugar, or less than twenty percent of total requirements. Over eighty percent of the domestically produced cane sugar is grown in Okinawa, and all of the beet sugar is produced in Hokkaido.

7. Fish. Before the war the total coastal and deep-sea fish catch from Japanese ports amounted to about three million metric tons. The 1943 catch is estimated to have been about twenty-five percent below normal. Hokkaido accounts for one-third of the total catch, and Kyushu for fifteen percent.

8. Livestock products. Livestock raising plays a minor role in Japanese agriculture. In 1943 Japan produced about 125,000 metric tons of meat.

Egg production in 1943-44 totalled 206,000 metric tons of which the prefecture of Aichi alone supplied sixteen percent. The prefectures of Shizuoka and Chiba produced somewhat over five percent each.

Milk production amounted to only 132,000 metric tons in 1943 (about two quarts per head per annum); Hokkaido, with one-third of the total productio is the leading prefecture.

The total production of processed dairy products was 20,000 metric tons in 1943. Hokkaido accounts for almost one-half of this amount.

B. Imports and Total Supply

The only major imports are rice, soybeans, other beans, sugar, and fish. Japan is dependent on Korea, Formosa, and other foreign areas for about fifteen percent of its rice requirements. It imports fifty-five percent of its soybeans and other beans, chiefly from Manchuria; over eighty percent of its sugar, principally from Formosa; and about ten percent of its fish supply.

In terms of food energy, total imports in 1943-44 were approximately at the pre-war level. Imports of sugar were about fifteen percent less and imports of rice seven percent less. Imports of beans, on the other hand, increased by about twenty percent and imports of soybeans by over seventy-five percent compared with the pre-war period.

Total supplies thus declined by little more than five percent. The sharpest reductions were in fish, sugar, fruits and vegetables. The supply of grains was fairly well maintained, and increases took place in beans, soybeans, Irish potatoes and sweet potatoes. (See Table 1.)

III. CONSUMPTION

Rice is by far the most important item in the Japanese diet. This does not mean, however, that the Japanese "lives on rice" to the exclusion of other foods.

The average pre-war diet of Japan is estimated to have supplied about 2270 calories per capita per day. About four-fifths of these calories were obtained from domestic production. Before the war, rice contributed about fifty-four percent of his total food energy (see Table 4). Other grains supplied eleven percent of the calories, sugar eight percent, sweet potatoes and potatoes seven percent, soybeans and other beans six percent, fish four percent, and all other foods ten percent. All livestock products together contributed only 1.4 percent of the total food energy.

Because of the preponderance of starchy foods, the average daily per capita intake of carbohydrates was 440 grams, most of which was supplied by rice, other cereals, and potatoes. The average protein consumption -- sixty-six grams a day -- was adequate. Although rice is not a good source of protein, the large quantities consumed make it the largest source. It is followed by fish and soybeans. The Japanese diet is notably deficient in fat -- twenty-seven grams per capita per day, or about one-half of the nutritional minimum. Oils, rice, soybeans, and fish are the most important sources of fat.

In 1940, sugar was rationed on a national scale (since 1938 on a local basis), and rationing of rice was introduced in many communities. In the following year, rice was rationed in Tokyo, Osaka and Kobe; and nation-wide rationing was finally instituted in February 1942. At the same time,

Table 4. ESTIMATED PER CAPITA FOOD CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS
Prewar Average (1935 - 1937 - 1939)

	Food Consumption Per Day[1] Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Total		2,270	100.0	66.4[5]	26.9	439.4
Rice	343	1,222	53.8	25.7	5.8	266.7
Wheat	39	139	6.1	3.6	0.4	30.2
Barley	14	50	2.2	1.1	0.1	11.0
Naked Barley	12	44	1.9	1.0	0.1	9.6
Minor Grains	3	12	0.5	0.3	0.0	2.5
Soybeans	27	95	4.2	9.4	4.9	3.2
Other beans	13	40	1.8	2.6	0.2	6.7
Sweet potatoes	120	130	5.7	1.8	0.7	28.9
Irish potatoes	50	36	1.6	0.9	0.1	8.0
Vegetables[2]	205	72	3.2	1.8	0.3	15.4
Fruits	40	20	0.9	0.2	0.1	4.5
Sugar	45	180	7.9	---	---	45.0
Fish	69	86	3.8	14.6	3.1	---
Meat	4	8	0.4	0.7	0.6	---
Eggs	7	11	0.5	0.9	0.8	0.1
Milk	10	7	0.3	0.4	0.4	0.5
Dairy products	1	4	0.2	0.2	0.3	0.1
Miscellaneous[4] (about 5% of total caloric intake)		114	5.0	1.2	9.0	7.0
Percentage contribution to total caloric intake				11.7%	10.7%	77.6%

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1. Based on production and net imports in 1935-36, 1937-38, and 1939-40; less deductions for non-food uses; feed, seed, milling offals, waste in distribution and industrial uses.
(Footnotes 2, 3, 4, and 5, on next page.)

Table 4. Footnotes (Cont.)

2. Cucumber, white cucumber, pumpkin, watermelon, muskmelon, eggplant, tomatoes, radishes, turnips, carrots, burdock, taro, lotus roots, green onions, cabbage.

3. Plums, peaches, loquat, Japanese pears, foreign pears, apples, persimmons, grapes, oranges, other citrus fruit.

4. Including oils, whale meat, aquicultural products and others.

5. 49.6 grams of vegetable protein and 16.8 grams of animal protein (or 25.3 percent of total protein).

other foodstuffs became subject to control, and at present there is hardly any food which is exempt from rationing.[1]

By 1944, the average energy intake had declined by about ten percent, to 2050 calories per capita per day (see Table 5).[2] The composition of the diet has not changed, except for a slight increase in the consumption of Irish potatoes and sweet potatoes, a decline in the consumption of sugar and oils, and a partial substitution of vegetable proteins (soybeans and other beans) for animal protein (fish). As a result of this substitution, only eighteen percent of the total protein is now derived from animal products. Nutrition experts consider that at least twenty-five percent should be animal proteins. The fat deficiency has been further aggravated. Soybeans and rice are now the most important sources, followed by oils and fish.

It is important to note that national averages are apt to conceal significant differences in levels of consumption between different groups of consumers. It is estimated[3] that in 1943-44 the non-farm population consumed less than 1900 calories per capita per day (see Table 6), whereas nearly 2300 calories were available to the average farm consumer (see Table 7).

Rations are differentiated according to age, sex, and degree of physical activity. There are fourteen different consumer groups in Japan, whose intake of food energy ranges from as much as 3600 calories for members of the armed forces to 1100 calories for small children (see Figure 1). Table 8

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[1] For more information on rationing of food see report on "Wartime Distribution of Food in Japan", prepared by the Office of Strategic Services, Research and Analysis Branch, R & A 2989.

[2] Estimates of wartime levels of consumption are based on rations as reported in the Japanese press, special allowances, and extra-legal consumption. These estimates were then checked and adjusted against available supplies (domestic production and imports). See Appendix A.

[3] See Appendix A for methods of estimation.

Table 5. ESTIMATED PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

Resident Population (National Average)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	343					
b. Actual ration[3]	323	1,149	56.0	24.2	5.5	250.0
Rice substitutes	20	75	3.6	2.5	1.0	13.9
Wheat and barley[4]	44	155	7.5	3.9	0.4	34.0
Soybeans[5]	31	109	5.3	10.9	5.7	3.7
Other beans	16	47	2.3	3.2	0.3	8.1
Sweet potatoes	127	137	6.7	1.9	0.8	30.5
Irish potatoes	44	32	1.6	0.7	0.0	7.0
Vegetables	173	61	3.0	1.6	0.3	13.0
Kelp	20	2	0.1	---	0.2	---
Fruits	33	16	0.8	0.2	0.1	3.7
Sugar[6]	28	111	5.4	---	---	27.8
Fish and Marine products	46	57	2.8	9.7	2.1	---
Meat	3	5	0.2	0.5	0.4	---
Eggs (in grams)	7	11	0.5	0.9	0.8	0.1
Milk	5	3	0.2	0.2	0.2	0.2
Dairy products	1	2	0.1	0.1	0.2	0.0
Oils	4	37	1.8	---	4.0	---
Miscellaneous (2% of average caloric intake)		41	2.0	4.0	1.0	4.0
TOTAL		2,050	100.0	64.5[7]	23.0	396.0
Percentage contribution to total caloric intake				12.6%	10.1%	77.3%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 53.1 grams of vegetable protein and 11.4 grams of animal protein (or 18% of total protein).

Table 6. ESTIMATED PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM POPULATION

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	340					
b. Actual ration[3]	306	1,089	58.1	22.9	5.2	237.6
Rice substitutes	34	126	6.7	4.3	1.7	23.4
Wheat and barley[4]	29	105	5.6	2.6	0.3	22.9
Soybeans[5]	30	105	5.6	10.5	5.4	3.6
Other beans	15	45	2.4	3.0	0.3	7.7
Sweet potatoes	60	65	3.5	0.9	0.4	14.5
Irish potatoes	26	19	1.0	0.4	0.0	4.2
Vegetables	115	40	2.1	1.0	0.2	8.6
Kelp	20	2	0.1	—	0.2	—
Fruits	25	13	0.7	0.2	0.1	2.8
Sugar[6]	28	111	5.9	—	—	27.9
Fish and Marine products	50	62	3.3	10.6	2.2	—
Meat	3	6	0.3	0.6	0.4	—
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	5	3	0.2	0.2	0.2	0.2
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	37	2.0	—	4.1	—
Miscellaneous (2% of average caloric intake)		37	2.0	3.0	1.0	4.0
TOTAL		1,874	100.0	60.9[7]	22.4	357.5
Percentage contribution to total caloric intake				13.0%	10.8%	76.2%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 48.8 grams of vegetable protein and 12.1 grams of animal protein (or 20% of total protein).

Table 7. ESTIMATED DAILY PER CAPITA FOOD RATIONS, CONSUMPTION ALLOWANCES AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS

1943 - 1944

FARM POPULATION

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice[1]	341	1,214	53.0	25.6	5.8	264.9
Wheat and barley	65	231	10.1	5.7	0.7	50.7
Soybeans[2]	33	116	5.1	11.5	6.0	4.0
Other beans	17	51	2.2	3.4	0.3	8.7
Sweet potatoes	225	243	10.6	3.4	1.4	54.2
Irish potatoes	70	50	2.2	1.2	0.1	11.2
Vegetables	260	91	4.0	2.3	0.4	19.5
Kelp	20	2	0.1	---	0.2	---
Fruits	44	22	1.0	0.3	0.1	4.9
Sugar[3]	28	111	4.9	---	---	27.9
Fish and Marine products	40	50	2.2	8.4	1.8	---
Meat	2	4	0.2	0.4	0.3	---
Eggs (in grams)	12	18	0.8	1.5	1.3	0.1
Milk	5	4	0.2	0.2	0.2	0.2
Dairy products	0.3	1	0.0	0.0	0.1	0.0
Oils	4	36	1.6	---	4.0	---
Miscellaneous (2% of average caloric intake)		46	2.0	4.0	1.1	5.0
TOTAL		2,290	100.0	67.9[4]	23.8	451.3
Percentage contribution to total caloric intake				11.9%	9.3%	78.8%

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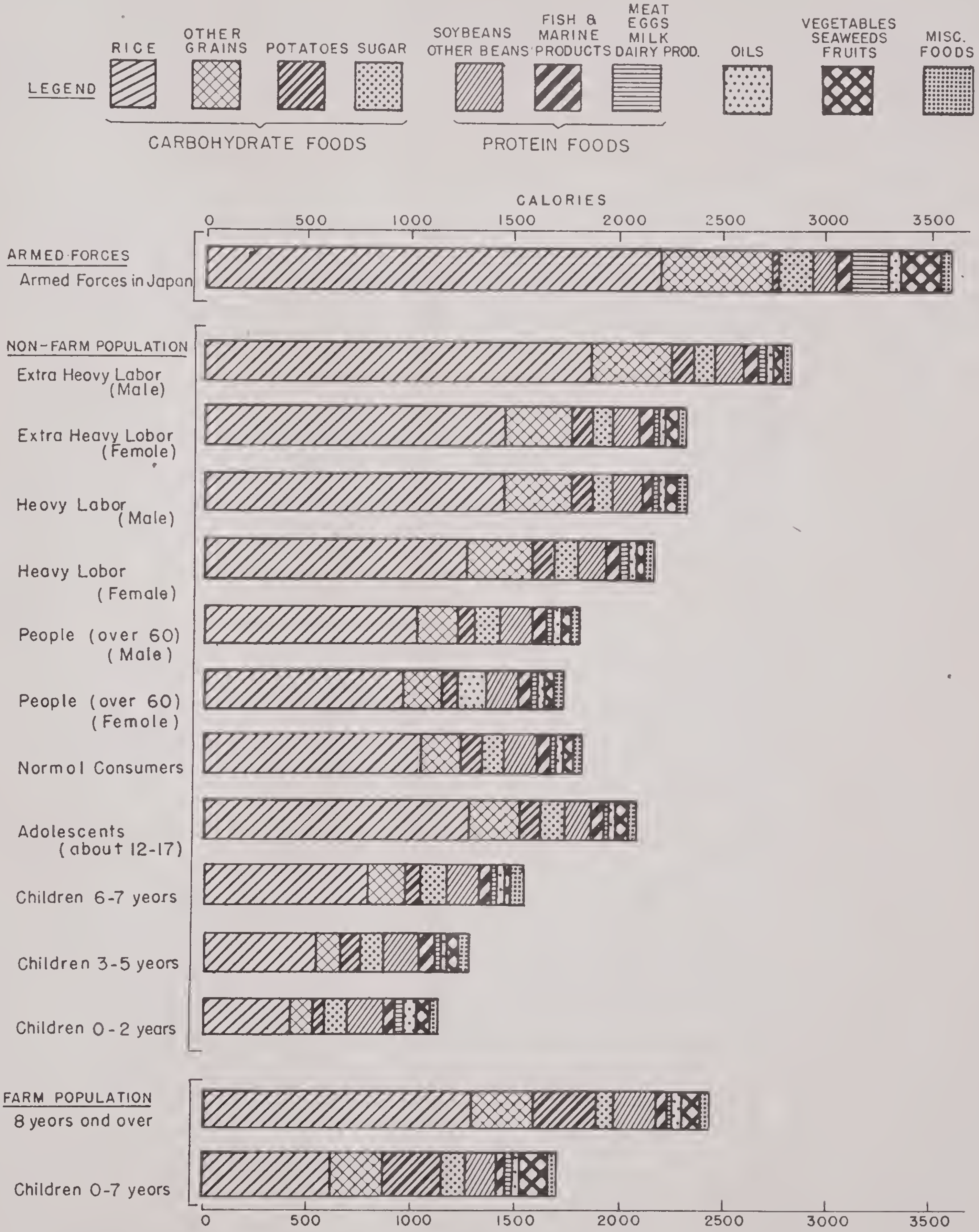
1. Pure rice; for estimates of rice consumption on farms, see Appendix A.
2. Including soysauce, beanpaste, etc., in terms of soybeans.
3. Including sugar in bakery goods, sweets, etc.
4. 57.4 grams of vegetable protein and 10.5 grams of animal protein (or 16% of total protein).

RESTRICTED

CALORIES PER CAPITA PER DAY
14 CONSUMER GROUPS – JAPAN PROPER
1943-44 AVERAGE



OSS PRESENTATION

Table 8. ESTIMATED DAILY PER CAPITA CALORIC INTAKE
BY CONSUMER GROUPS
1943 - 1944

Consumer Group	Percentage of Total Population	Calories
Non-Farm Population	60.1	1,874
Extra heavy labor (Male)	0.8	2,832
(Female)	0.1	2,331
Heavy labor (Male)	10.8	2,328
(Female)	3.5	2,150
Old people over 60 (Male)	2.1	1,782
(Female)	2.7	1,711
Children (0-2 years)	4.0	1,121
(3-5 years)	4.1	1,261
(6-7 years)	2.7	1,528
Adolescents (about 12-17 years)	8.1	2,073
Normal consumers	21.2	1,822
Farm Population	39.9	2,290
Children (0-7 years)	7.8	1,688
All others (8 and over)	32.1	2,429
Total Population Resident in Japan	100.0	2,050

shows the percentages of the population in the various consumer groups, and their average levels of caloric intake. More than one-third of the civilian non-farm population or twenty percent of the total resident population is defined as "normal consumers." Members of this category -- adults who are as a rule not engaged in work requiring heavy expenditure of energy -- receive only about 1800 calories per day, including such non-rationed and black market supplies as may be available to the average individual. Men engaged in extra-heavy work are entitled to supplementary rations which raise their total daily consumption level to more than 2800 calories. Heavy workers receive 2300 calories per day. Women in these categories receive 2330 and 2150 calories, respectively. Old people (over 60 years) are given less than 1800 calories. Non-farm children under two years of age receive 1100 calories, children between three and five years 1260, children between six and seven years 1530, and adolescents 2070 calories per day. The consumption of farm children under seven years amounts to almost 1700 calories, while the farm population over seven years of age averages 2430 calories per capita per day. The daily per capita consumption of the various categories by individual foodstuffs and the nutritive value of their diet are presented in Tables 9 - 22. The differences in energy intake are shown to be substantially attributable to differences in the rice ration.

Except for members of the armed forces, workers essential to the war effort would appear to be the most favored group. It should be remembered, however, that the energy requirements of these groups exceed considerably those of the normal consumer. If calorie allowances are compared with calorie requirements,[1] it appears that in reality the workers are least adequately

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[1] See footnote 1 in Table 23.

Table 9. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM NORMAL CONSUMERS

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	330					
b. Actual ration[3]	297	1,057	58.0	22.3	5.0	230.8
Rice substitutes[4]	33	122	6.7	4.1	1.7	22.7
Wheat and barley[4]	25	89	4.9	2.2	0.2	19.5
Soybeans[5]	30	105	5.8	10.5	5.4	3.6
Other beans	15	45	2.5	3.0	0.3	7.7
Sweet potatoes	60	65	3.6	0.9	0.4	14.5
Irish potatoes	25	18	1.0	0.4	0.0	4.0
Vegetables	115	40	2.2	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits	25	12	0.6	0.2	0.1	2.8
Sugar[6]	28	111	6.1	---	---	27.9
Fish and Marine products	50	62	3.4	10.6	2.2	---
Meat	3	6	0.3	0.6	0.4	---
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	36	2.0	---	4.0	---
Miscellaneous (2% of average caloric intake)		41	2.2	4.0	1.0	4.0
TOTAL		1,822	100.0	60.6[7]	21.9	346.3
Percentage contribution to total caloric intake				13.3%	10.8%	75.9%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. [illegible] 12.0 grams animal protein ([illegible] of total protein),

Table 10. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM EXTRA HEAVY LABOR, MALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	580					
b. Actual ration[3]	522	1,858	65.6	39.2	8.9	405.6
Rice substitutes	58	215	7.6	7.2	2.9	39.9
Wheat and barley[4]	55	196	6.9	4.8	0.6	42.9
Soybeans[5]	30	105	3.7	10.5	5.4	3.6
Other beans	15	45	1.6	3.0	0.3	7.7
Sweet potatoes	60	65	2.3	0.9	0.4	14.5
Irish potatoes	35	25	0.9	0.6	0.0	5.6
Vegetables	115	40	1.4	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits[6]	15	8	0.3	0.1	0.0	1.7
Sugar	28	111	3.9	---	---	27.9
Fish and Marine products	50	62	2.2	10.6	2.2	---
Meat	3.8	8	0.3	0.7	0.5	---
Eggs (in grams)	4	6	0.2	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4.5	40	1.4	---	4.5	---
Miscellaneous (2% of average caloric intake)		41	1.4	4.0	1.0	4.0
TOTAL		2,832	100.0	83.4[7]	27.9	562.2
Percentage contribution to total caloric intake				11.8%	8.9%	79.4%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 71.3 grams of vegetable protein and 12.1 grams of animal protein (or 15% of total proteins).

Table 11. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN
BY CALORIES AND FOOD CONSTITUENTS[1]
1943 – 1944
NON-FARM EXTRA HEAVY LABOR, FEMALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	450					
b. Actual ration[3]	405	1,442	61.9	30.4	6.9	314.7
Rice substitutes	45	166	7.1	5.6	2.2	30.9
Wheat and barley	45	160	6.9	4.0	0.4	35.1
Soybeans	30	105	4.5	10.5	5.4	3.6
Other beans	15	45	1.9	3.0	0.3	7.7
Sweet potatoes	60	65	2.8	0.9	0.4	14.5
Irish potatoes	35	25	1.1	0.6	0.0	5.6
Vegetables	115	40	1.7	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits	15	8	0.3	0.1	0.0	1.7
Sugar[6]	28	111	4.8	---	---	27.9
Fish and Marine products	50	62	2.7	10.6	2.2	---
Meat	3.8	8	0.3	0.7	0.5	---
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4.5	40	1.7	---	4.5	---
Miscellaneous (2% of average caloric intake)		41	1.8	4.0	1.0	4.0
TOTAL		2,331	100.0	72.2[7]	25.0	454.5
Percentage contribution to total caloric intake				12.4%	9.7%	77.9%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean, and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 60.1 grams of vegetable protein and 12.1 grams of animal protein (or 17% of total protein).

Table 12. ESTIMATED PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM HEAVY LABOR, MALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	450					
b. Actual ration[3]	405	1,442	61.9	30.4	6.9	314.7
Rice substitutes	45	166	7.1	5.6	2.2	30.9
Wheat and barley[4]	45	160	6.9	4.0	0.4	35.1
Soybeans[5]	30	105	4.5	10.5	5.4	3.6
Other beans	15	45	1.9	3.0	0.3	7.7
Sweet potatoes	60	65	2.8	0.9	0.4	14.5
Irish potatoes	30	22	1.0	0.5	0.0	4.8
Vegetables	115	40	1.7	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits	15	8	0.3	0.1	0.0	1.7
Sugar[6]	28	111	4.8	---	---	27.9
Fish and Marine products	50	62	2.7	10.6	2.2	---
Meat	3.8	8	0.3	0.7	0.5	---
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4.5	40	1.7	---	4.5	---
Miscellaneous (2% of average caloric intake)		41	1.8	4.0	1.0	4.0
TOTAL		2,328	100.0	72.1	25.0	453.7
Percentage contribution to total caloric intake				12.4%	9.7%	77.9%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed food-stuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 60.0 grams of vegetable protein and 12.1 grams of animal protein (or 17% of total protein).

Table 13. ESTIMATED PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]
1943 - 1944
NON-FARM HEAVY LABOR, FEMALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	400					
b. Actual ration[3]	360	1,282	59.6	27.0	6.1	279.7
Rice substitutes	40	148	6.9	5.0	2.0	27.5
Wheat and barley[4]	45	160	7.4	4.0	0.4	35.1
Soybeans[5]	30	105	4.9	10.5	5.4	3.6
Other beans	15	45	2.1	3.0	0.3	7.7
Sweet potatoes	60	65	3.0	0.9	0.4	14.5
Irish potatoes	30	22	1.0	0.5	0.0	4.8
Vegetables	115	40	1.9	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits	15	8	0.4	0.1	0.0	1.7
Sugar[6]	28	111	5.2	---	---	27.9
Fish and Marine products	50	62	2.9	10.6	2.2	---
Meat	3.8	8	0.4	0.7	0.5	---
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4.5	40	1.9	---	4.5	---
Miscellaneous (2% of average caloric intake)		41	1.9	4.0	1.0	4.0
TOTAL		2,150	100.0	68.1[7]	24.0	415.3
Percentage contribution to total caloric intake				12.7%	10.0%	77.3%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 56.0 grams of vegetable protein and 12.1 grams of animal protein (or 18% of total protein).

Table 14. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN
BY CALORIES AND FOOD CONSTITUENTS[1]
1943 - 1944
NON-FARM OLD PEOPLE (over 60 yrs.) - MALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	320					
b. Actual ration[3]	288	1,025	57.5	21.6	4.9	223.8
Rice substitutes	32	118	6.6	4.0	1.6	22.0
Wheat and barley[4]	25	89	5.0	2.2	0.2	19.5
Soybeans[5]	30	105	5.9	10.5	5.4	3.6
Other beans	15	45	2.5	3.0	0.3	7.7
Sweet potatoes	60	65	3.7	0.9	0.4	14.5
Irish potatoes	25	18	1.0	0.4	0.0	4.0
Vegetables	115	40	2.2	1.0	0.2	8.6
Kelp	20	2	0.1	—	0.2	—
Fruits	15	8	0.4	0.1	0.0	1.7
Sugar[6]	28	111	6.2	—	—	27.9
Fish and Marine products	50	62	3.5	10.6	2.2	—
Meat	3	6	0.3	0.6	0.4	—
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	36	2.0	—	4.0	—
Miscellaneous (2% of average caloric intake)		41	2.3	4.0	1.0	4.0
TOTAL		1,782	100.0	59.7[7]	21.6	337.5
Percentage contribution to total caloric intake				13.4%	10.9%	75.7%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 47.7 grams of vegetable protein and 12.0 grams of animal protein (or 20% of total protein).

Table 15. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM OLD PEOPLE (over 60 years) - FEMALE

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	300					
b. Actual ration[3]	270	961	56.2	20.2	4.6	209.8
Rice substitutes	30	111	6.5	3.8	1.5	20.6
Wheat and barley[4]	25	89	5.2	2.2	0.2	19.5
Soybeans[5]	30	105	6.1	10.5	5.4	3.6
Other beans	15	45	2.6	3.0	0.3	7.7
Sweet potatoes	60	65	3.8	0.9	0.4	14.5
Irish potatoes	25	18	1.1	0.4	0.0	4.0
Vegetables	115	40	2.3	1.0	0.2	8.6
Kelp	20	2	0.1	---	0.2	---
Fruits	15	8	0.5	0.1	0.0	1.7
Sugar[6]	28	111	6.5	---	---	27.9
Fish and Marine products	50	62	3.6	10.6	2.2	---
Meat	3	6	0.4	0.6	0.4	---
Eggs (in grams)	4	6	0.4	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	36	2.1	---	4.0	---
Miscellaneous (2% of average caloric intake)		41	2.4	4.0	1.0	4.0
TOTAL		1,711	100.0	58.1[7]	21.2	322.1
Percentage contribution to total caloric intake				13.6%	11.1%	75.3%

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[1] Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.

[2] Including other grains, soybean and potato flour, etc., used as substitutes.

[3] Estimated actual rice ration.

[4] Bread, noodles, flour, etc., in terms of flour.

[5] Including soysauce, beanpaste, etc., in terms of soybeans.

[6] Including sugar in bakery goods, sweets, etc.

[7] 46.1 grams of vegetable protein and 12.0 grams of animal protein (or 21% of total protein).

Table 16. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM CHILDREN (0-2 yrs.)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	130					
b. Actual ration[3]	117	416	37.1	8.8	2.0	90.9
Rice substitutes	13	48	4.3	1.6	0.7	8.9
Wheat and barley[4]	20	71	6.3	1.8	0.2	15.6
Soybeans[5]	30	105	9.4	10.5	5.4	3.6
Other beans	15	45	4.0	3.0	0.3	7.7
Sweet potatoes	60	65	5.8	0.9	0.4	14.5
Irish potatoes	25	18	1.6	0.4	0.0	4.0
Vegetables	115	40	3.6	1.0	0.2	8.6
Kelp	20	2	0.2	---	0.2	---
Fruits	45	22	2.0	0.3	0.1	5.0
Sugar[6]	28	111	9.9	---	---	27.9
Fish and Marine products	50	62	5.5	10.6	2.2	---
Meat	3	6	0.5	0.6	0.4	---
Eggs (in grams)	4	6	0.5	0.5	0.5	0.0
Milk	35	24	2.1	1.2	1.4	1.7
Dairy products	1	3	0.3	0.2	0.2	0.1
Oils	4	36	3.2	---	4.0	---
Miscellaneous (2% of average caloric intake)		41	3.7	4.0	1.0	4.0
TOTAL		1,121	100.0	45.4[7]	19.2	192.5
Percentage contribution to total caloric intake				16.1%	15.4%	68.5%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 32.3 grams of vegetable protein and 13.1 grams of animal protein (or 29% of total protein).

Table 17. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS[1]

1943 - 1944

NON-FARM CHILDREN (3-5 yrs.)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	175					
b. Actual ration[3]	157	559	44.3	11.8	2.7	122.0
Rice substitutes	18	67	5.3	2.2	0.9	12.4
Wheat and barley[4]	20	71	5.6	1.8	0.2	15.6
Soybeans[5]	30	105	8.3	10.5	5.4	3.6
Other beans	15	45	3.6	3.0	0.3	7.7
Sweet potatoes	60	65	5.2	0.9	0.4	14.5
Irish potatoes	25	18	1.4	0.4	0.0	4.0
Vegetables	115	40	3.2	1.0	0.2	8.6
Kelp	20	2	0.2	---	0.2	---
Fruits	45	22	1.7	0.3	0.1	5.0
Sugar[6]	28	111	8.8	---	---	27.9
Fish and Marine products	50	62	4.9	10.6	2.2	---
Meat	3	6	0.5	0.6	0.4	---
Eggs (in grams)	4	6	0.5	0.5	0.5	0.0
Milk	2.8	2	0.2	0.1	0.1	0.1
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	36	2.9	---	4.0	---
Miscellaneous (2% of average caloric intake)		41	3.2	4.0	1.0	4.0
TOTAL		1,261	100.0	47.9[7]	18.8	225.5
Percentage contribution to total caloric intake				15.2%	13.4%	71.4%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 35.9 grams of vegetable protein and 12.0 grams of animal protein (or 25% of total protein).

Table 18. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN
BY CALORIES AND FOOD CONSTITUENTS 1/
1943 - 1944
NON-FARM CHILDREN (6-7 years)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	250					
b. Actual ration[3]	225	801	52.4	16.9	3.8	174.8
Rice substitutes	25	92	6.0	3.1	1.2	17.2
Wheat and barley[4]	20	71	4.7	1.8	0.2	15.6
Soybeans[5]	30	105	6.9	10.5	5.4	3.6
Other beans	15	45	2.9	3.0	0.3	7.7
Sweet potatoes	60	65	4.2	0.9	0.4	14.5
Irish potatoes	25	18	1.2	0.4	0.0	4.0
Vegetables	115	40	2.6	1.0	0.2	8.6
Kelp	20	2	0.1	----	0.2	-----
Fruits	45	22	1.4	0.3	0.1	5.0
Sugar[6]	28	111	7.3	----	---	27.9
Fish and Marine products	50	62	4.1	10.6	2.2	-----
Meat	3	6	0.4	0.6	0.4	-----
Eggs(in grams)	4	6	0.4	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.2	0.2	0.2	0.1
Oils	4	36	2.4	----	4.0	-----
Miscellaneous (2% of average caloric intake)		41	2.7	4.0	1.0	4.0
TOTAL		1,528	100.0	53.9[7]	20.2	283.1
Percentage contribution to total caloric intake				14.1%	11.9%	74.0%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean, and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 41.9 grams of vegetable protein and 12.0 grams of animal protein (or 22% of total protein).

Table 19. ESTIMATED DAILY PER CAPITA FOOD RATIONS AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS 1/

1943 - 1944

NON-FARM ADOLESCENTS (about 12-17 years)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice						
a. Nominal ration[2]	400					
b. Actual ration[3]	360	1,282	61.8	27.0	6.1	279.7
Rice substitutes	40	148	7.1	5.0	2.0	27.5
Wheat and barley[4]	25	89	4.3	2.2	0.2	19.5
Soybeans[5]	30	105	5.1	10.5	5.4	3.6
Other beans	15	45	2.2	3.0	0.3	7.7
Sweet potatoes	60	65	3.1	0.9	0.4	14.5
Irish potatoes	25	18	0.9	0.4	0.0	4.0
Vegetables	115	40	1.9	1.0	0.2	8.6
Kelp	20	2	0.1	----	0.2	-----
Fruits	25	12	0.6	0.2	0.1	2.8
Sugar[6]	28	111	5.4	----	---	27.9
Fish and Marine products	50	62	3.0	10.6	2.2	-----
Meat	3	6	0.3	0.6	0.4	-----
Eggs (in grams)	4	6	0.3	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4	36	1.7	----	4.0	-----
Miscellaneous (2% of average caloric intake)		41	2.0	4.0	1.0	4.0
TOTAL		2,073	100.0	66.2[7]	23.3	400.0
Percentage contribution to total caloric intake				12.8%	10.1%	77.1%

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1. Based on official rations, including occasional extra allowances and estimated consumption of unrationed foodstuffs and illegal consumption.
2. Including other grains, soybean, and potato flour, etc., used as substitutes.
3. Estimated actual rice ration.
4. Bread, noodles, flour, etc., in terms of flour.
5. Including soysauce, beanpaste, etc., in terms of soybeans.
6. Including sugar in bakery goods, sweets, etc.
7. 54.2 grams of vegetable protein and 12.0 grams animal protein (or 18% of total protein)

Table 20. ESTIMATED DAILY PER CAPITA FOOD RATIONS, CONSUMPTION ALLOWANCES, AND ESTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS
1943 - 1944
FARM CHILDREN (0-7 years)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice[1]	180	641	38.0	13.5	3.1	139.9
Wheat and barley	65	231	13.7	5.7	0.7	50.7
Soybeans[2]	25	88	5.2	8.7	4.5	3.0
Other beans	17	51	3.0	3.4	0.3	8.7
Sweet potatoes	225	243	14.4	3.4	1.4	54.2
Irish potatoes	70	50	3.0	1.2	0.1	11.2
Vegetables	260	91	5.4	2.3	0.4	19.5
Kelp	20	2	0.1	----	0.2	-----
Fruits	44	22	1.3	0.3	0.1	4.9
Sugar[3]	28	111	6.6	----	---	27.9
Fish and Marine products	40	50	3.0	8.4	1.8	-----
Meat	2	4	0.2	0.4	0.3	-----
Eggs (in grams)	10	16	1.0	1.3	1.2	0.1
Milk	14.3	10	0.6	0.6	0.6	0.7
Dairy products	0.3	1	0.1	0.0	0.1	0.0
Oils	4	36	2.1	----	4.0	-----
Miscellaneous (2% of average caloric intake)		41	2.4	4.0	1.0	4.0
TOTAL		1,688	100.0	53.2[4]	19.8	324.8
Percentage contribution to total caloric intake				12.6%	10.5%	76.9%

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1. Pure rice; for estimates of rice consumption on farms, see Appendix A.
2. Including soysauce, beanpaste, etc., in terms of soybeans.
3. Including sugar in bakery goods, sweets, etc.
4. 42.5 grams of vegetable protein and 10.7 grams of animal protein (or 20% of total protein).

Table 21. ESTIMATED DAILY PER CAPITA FOOD RATIONS, CONSUMPTION ALLOWANCES, AND EXTRA-LEGAL CONSUMPTION IN JAPAN BY CALORIES AND FOOD CONSTITUENTS
1943 - 1944
FARM POPULATION (over 7 years)

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice[1]	380	1,353	55.7	28.5	6.5	295.3
Wheat and barley	65	231	9.5	5.7	0.7	50.7
Soybeans[2]	35	122	5.0	12.2	6.3	4.2
Other beans	17	51	2.1	3.4	0.3	8.7
Sweet potatoes	225	243	10.0	3.4	1.4	54.2
Irish potatoes	70	50	2.1	1.2	0.1	11.2
Vegetables	260	91	3.8	2.3	0.4	19.5
Kelp	20	2	0.1	----	0.2	-----
Fruits	44	22	0.9	0.3	0.1	4.9
Sugar[3]	28	111	4.6	----	---	27.9
Fish and Marine products	40	50	2.1	8.4	1.8	-----
Meat	2	4	0.2	0.4	0.3	-----
Eggs (in grams)	12	19	0.8	1.5	1.4	0.1
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	0.3	1	0.0	0.0	0.1	0.0
Oils	4	36	1.5	----	4.0	-----
Miscellaneous (2% of average caloric intake)		41	1.7	4.0	1.0	4.0
TOTAL		2,429	100.0	71.4[4]	24.7	480.8
Percentage contribution to total caloric intake				11.8%	9.1%	79.1%

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1. Pure rice; for estimates of rice consumption on farms, see Appendix A.
2. Including soysauce, beanpaste, etc., in terms of soybeans.
3. Including sugar in bakery goods, sweets, etc.
4. 61.0 grams of vegetable protein and 10.4 grams of animal protein (or 15% of total protein).

Table 22. ESTIMATED DAILY PER CAPITA FOOD RATIONS IN JAPAN BY CALORIES AND FOOD CONSTITUENTS
1943 - 1944
ARMED FORCES IN JAPAN

	Food Consumption Per Day Grams	Calories	Contribution to Caloric Intake Percent	Proteins Grams	Fats Grams	Carbohydrates Grams
Rice[1]	620	2,207	61.7	46.5	10.5	481.7
Wheat and barley[2]	150	534	14.9	13.2	1.5	117.0
Soybeans[3]	30	105	2.9	10.5	5.4	3.6
Other beans	15	45	1.3	3.0	0.3	7.7
Sweet potatoes	10	11	0.3	0.2	0.1	2.4
Irish potatoes	35	25	0.7	0.6	0.0	5.6
Vegetables	500	175	4.9	4.5	0.8	37.5
Kelp	20	2	0.1	----	0.2	-----
Fruits	20	10	0.3	0.1	0.1	2.2
Sugar[4]	30	119	3.3	----	----	29.9
Fish and Marine products	58	72	2.0	12.2	2.6	-----
Meat	90	180	5.0	16.7	12.6	-----
Eggs (in grams)	4	6	0.2	0.5	0.5	0.0
Milk	2.8	2	0.1	0.1	0.1	0.1
Dairy products	1	3	0.1	0.2	0.2	0.1
Oils	4.5	40	1.1	----	4.5	-----
Miscellaneous (2% of average caloric intake)		41	1.2	4.0	1.0	4.0
TOTAL		3,577	100.0	112.3[5]	40.4	691.8
Percentage contribution to total caloric intake				12.5%	10.2%	77.3%

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1. Pure rice.
2. Bread, noodles, flour, etc., in terms of flour.
3. Including soysauce, beanpaste, etc., in terms of soybeans.
4. Including sugar in bakery goods, sweets, etc.
5. 82.6 grams of vegetable protein and 29.7 grams of animal protein (or 26% of total protein).

Table 23. DAILY PER CAPITA CALORIC INTAKE IN JAPAN COMPARED WITH DAILY PER CAPITA CALORIC REQUIREMENTS[1]

1943 - 1944

	Consumer Groups	Calorie Requirements[2] (range) (calories)	Average Calorie Requirements (calories)	Per Capita Caloric Intake (calories)	Percentage Caloric Intak is of Requirements (Percent)
Children	1 - 2	1000 - 1200	1100	1121	102
	2 - 5	1200 - 1500	1350	1261	93
	6 - 7	1400 - 1800	1600	1528	96
Adolescents	12 - 17	2400 - 3600	3000	2073	69
Normal Consumers[3]		1800 - 3000	2400	1894	79
Heavy Workers		3100 - 3940	3520	2328	66
Extra Heavy Workers		4000 - 4800	4400	2832	64
Garrison Troops		3000 - 4040	3520	3577	102

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1. The standard of requirements used in this table indicates long-term levels of adequate nutrition, rather than minimum wartime consumption levels.
2. For sources of calorie requirements see Appendix B.
3. Including light workers (about 50%): 2625 calories; others: 2200 calories.

Table 24. SUBSTITUTION RATES1/

A. Quantities of Specified Foodstuffs Equivalent in Calories, Proteins or Fats to 1000 grams of Rice2/

B. Quantities of Specified Foodstuffs3/ Equivalent in Proteins to 1000 grams of Fish4/

	A. Calorie equivalent5/ (grams)	A. Protein equivalent6/ (grams)	A. Fat equivalent7/ (grams)	B. Protein equivalent8/ (grams)
Rice	1,000	1,000	1,000	
Wheat	1,003	806	1,700	
Barley	997	915	1,700	
Naked barley	997	915	1,700	
Minor grains	1,017	882	1,700	
Soybeans, dried	1,017	215	94	605
Other beans, dried	1,187	375	944	1,055
Sweet potatoes	3,296	5,000	2,833	
Irish potatoes	4,944	4,410	17,000	
Sugar	894	--	--	
Fish, medium-fat	2,848	355	378	1,000
Canned corned beef, medium	1,703	296	142	834
Eggs	2,253	586	148	1,648
Milk, fresh, whole,	5,159	2,143	436	
Condensed milk, sweetened	1,089	926	202	
Evaporated milk, unsweetened	2,561	1,071	215	
Dried Milk, whole	718	291	64	818
Butter	486	12,500	21	
Vegetable oil	396	--	17	

1/ For source of nutritive factors see Appendix A.

2/ 1,000 grams of brown rice contain 75 grams of protein, 17 grams of fat and supply 3,560 calories.

3/ Only foodstuffs which are good sources for protein (containing more than 10%).

4/ 1,000 grams of medium fat fish contain 211 grams of protein, 45 grams of fat and supply 1,250 calories (these figures are an average of different kinds of fish).

5/ 1,003 grams of wheat, or 894 grams of sugar, or 396 grams of vegetable oil, etc. are required to provide the same amount of calories as is supplied by 1,000 grams of brown rice.

6/ 806 grams of wheat, or 215 grams of dried soybeans etc. may be substituted for 1,000 grams of brown rice to provide the same amount of protein.

7/ 1,000 grams of brown rice supply the same amount of fat as do 94 grams of dried soybeans, or 17,000 grams of potatoes, or 17 grams of vegetable oil etc.

8/ 1,000 grams of fish supply about the same amount of protein as 605 grams of dried soybeans or 834 grams of canned corned beef (medium) etc. (animal protein can only partly be substituted by vegetable protein; at least 25 percent of the total protein intake should be of animal origin).

IV. FOOD BALANCE FOR 1943 - 1944

In 1943-44, the total domestic production of food in Japan was equivalent to a net supply of about 1,820 calories per capita per day. Average daily consumption amounted to 2,050 calories per head.[1] The islands therefore supplied nearly ninety percent of their consumption from domestic resources.

Before the war, Japan depended on imports for somewhat less than twenty percent of its requirements. It produced about 1,840 calories per capity per day and consumption averaged 2,270 calories. Owing to wartime shortages of labor and fertilizer, by 1943 the production of original food energy from the soil had declined by about five percent.[2] However, by reducing the degree of polishing and other forms of waste, and by curtailing the quantity of grain directed to non-food uses (sake etc.)[3], the five percent drop in production was about offset, so that the total quantity of food available for human consumption, in terms of ultimate food energy, could be maintained at the pre-war level. With a slight increase in the population resident in Japan the per capita energy supply from domestic production was only barely lower than pre-war. Per capita consumption, on the other hand, was reduced by about ten percent, thus raising the degree of self-sufficiency from about eighty percent to almost ninety percent.

It is interesting to note that the ten percent curtailment of consumption was not dictated by the inability of the Japanese to import the necessary supplies. Net food imports in the crop year 1943-44 are believed to have amounted to about 405 calories per head per day, or about ninety-five percent of the pre-war level (average 1935-36, 1937-38, 1939-40). Thus

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1. See Section III
2. See Section II
3. See Page 40

(Footnote 3 from previous page.)

3/ The following table illustrates how the decline in the rice supply available for all uses was offset in part by curtailing the quantity of rice used for sake, lost in polishing etc.

Year	Per capita per annum disappearance (koku)	Percentage of prewar (%)	Deductions for non-food uses, seed and waste (koku)	Percentage of prewar (%)	Amount available for human consumption (per capita per annum) (koku)	Percentage of prewar (%)
Prewar	1.1	100	0.24	100	0.86	100
1943-44	0.93	85	0.12	50	0.81	94

production and imports could have supplied 2,225 calories in 1943-44, that is, only two percent less than pre-war consumption; but according to prevailing rations and estimated illegal disappearance, consumption appears to have run about 175 calories less. It is believed that the difference is accounted for by further addition to stocks. It appears that rations have been cut to a bare minimum in order to build up reserves in the expectation of an Allied blockade. The bulk of these stocks consist of rice, supplemented by sugar and some preserved fish.

The present size of Japan's accumulated stocks of rice is of course a subject of speculation. Whereas wartime levels of production and rationed consumption can be estimated with a relatively high degree of reliability, estimates of imports and of extra-legal consumption are necessarily subject to a wide margin of error. Two alternative estimates were therefore prepared. Both start in 1938-39, the last year for which reliable official data on foreign trade and carry-over are available. From then on, the cumulative movement of stocks was calculated on the basis of estimates of production, net imports, and consumption. One estimate indicates a possible maximum stock position. It is based on the assumption of a high efficiency of production and distribution controls and a high level of imports (Assumption A). The other is a probable minimum estimate, assuming less strict and well administered rationing and somewhat lower imports (Assumption B).[1] The derivation of these estimates is shown in Table 25. They would indicate that the carry-over at the end of 1943-44 ranged between 3.8 and 6.4 million metric tons. This is equivalent to between five and eight months' rice requirements,

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[1] The estimates used in Table 26, column 1 are midway between these extremes.

or between two and one-half and four months' total caloric requirements, at present consumption rates.

Estimates of sugar stocks vary from 250,000 to 750,000 metric tons. Wheat and barley stocks may amount to nearly 250,000 tons; stocks of soybeans to 150,000 tons. There are indications that Japan has considerable reserves of smoked and canned fish, amounting to between twenty and fifty percent of annual consumption. These reserves can be drawn upon to meet current requirements in the event of an effective blockade.

The complete food balance of Japan for 1943-44, by individual foodstuffs, is presented in Table 26. This table shows consumption by various consumer groups, non-food uses including seed, feed, and waste, total supplies as derived from domestic production and imports, and movement of stocks. In 1943-44, rice imports amounted to about fifteen percent of the total new supply; but two-thirds of the imports seems to have been added to the stockpile. Japan was dependent on imports for two-thirds of its soybean requirements, forty-five percent of its requirements of other beans. It imported eighty-five percent of its sugar supply, but twenty percent of these imports seem to have been added to stocks. Fish imports are estimated to represent about ten percent of the total supply, but an even larger quantity than this is believed to have been carried over to the following year.

While Japan as a whole has reached a rather high degree of self-sufficiency in food, large areas of Japan show a degree of dependence on imports which is far in excess of the national average. Conversely, other areas show small surpluses over requirements.

Table ~~27~~ 25. SUPPLY AND UTILIZATION OF RICE
JAPAN PROPER
1939 - 1945

	Rationing Measures	Estimated Population Resident in Japan (000)	Estimated Annual per Capita Disappearance[1]	(Koku)	(MT)	SUPPLY				UTILIZATION			
						Carry - over from Previous Year (000 MT)	Production (000 MT)	Imports (000 MT)	Total Supply (000 MT)	Exports (000 MT)	Disappearance[1] (000 MT)	Carry-over to Next Year (000 MT)	Total Utilization (000 MT)
1938-1939	Shortages begin to be felt					1,242 2/	9,633 2/	1,430 2/	12,305	111 2/	11,601 2/	593 2/	12,305
1939-1940	Local rationing is introduced in many communities	71,450	Assumption A	1.08	0.158	593 2/	10,086 2/	2,350	13,029	100	11,286	1,643	13,029
			Assumption B	1.10	0.161			2,282 3/	12,961		11,495	1,366	12,961
1940-1941	Rationing is instituted in Tokyo, Osaka, and Kobe	71,600	Assumption A	1.06	0.154	1,643	8,903 2/	3,400	13,946	75	11,100	2,771	13,946
			Assumption B	1.08	0.156	1,366		3,200	13,469		11,309	2,085	13,469
1941-1942	In February 1942 rationing is introduced on a national basis	71,750	Assumption A	1.04	0.149	2,771	8,055 3/	3,550	14,376	75	10,913	3,388	14,376
			Assumption B	1.06	0.152	2,085		3,350	13,490		11,123	2,292	13,490
1942-1943	Percentage of rice substitutes increases gradually	71,900	Assumption A	0.98	0.143	3,388	9,766 4/	2,200	15,354	75	10,305	4,974	15,354
			Assumption B	1.01	0.146	2,292		1,750	13,808		10,621	3,112	13,808
1943-1944		72,000	Assumption A	0.91	0.133	4,974	9,197 5/	1,900	16,071	70	9,585	6,416	16,071
			Average of A&B	0.93	0.136	4,043		1,750	14,990		9,792	5,128	14,990
			Assumption B	0.95	0.139	3,112		1,600	13,909		10,004	3,835	13,909
1944-1945		72,000	Assumption A	0.90	0.132	6,416	8,737 6/	1,400	16,553	50	9,477	7,026	16,553
			Average of A&B	0.92	0.135	5,128		1,100	14,965		9,688	5,227	14,965
			Assumption B	0.94	0.137	3,835		800	13,372		9,898	3,424	13,372

1/ Including non-food uses, waste, and offals.

2/ The Oriental Economist Yearbook, 1941, p. 148 (Toyo Keizai Shimpo Keisai Nenkan).

3/ Japan Times and Advertizer, 15 March 1942.

4/ Yomiuri Shimbun, 7 April 1943.

5/ Tokyo broadcast to home audience, 14 March 1944.

6/ Assuming a decrease of five percent from 1943, based on Japanese official reports of January 1945.

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Tabla ~~9~~8-I. FOOD BALANCE OF JAPAN 1943-44
STAPLE FOOD CROPS

			1		2		3		4		5		6	
		Populetion in Group	R I C E Daily per Capital/ Coneumption Grams	R I C E Total per Annum MT	WHEAT, BARLEY AND MINOR GRAINS Daily par Capita1/ Consumption Grams	WHEAT, BARLEY AND MINOR GRAINS Total per Annum MT	S O Y B E A N S Daily per Cepita1/ Consumption Grams	S O Y B E A N S Total per Annum MT	O T H E R B E A N S Daily per Capita1/ Consumption Grams	O T H E R B E A N S Total per Annum MT	SWEET POTATOES Daily per Capita1/ Consumption Grame	SWEET POTATOES Total per Annum MT	IRISH POTATOES Daily per Cepita1/ Consumption Grams	IRISH POTATOES Total per Annum MT
NON-FARM POPULATION		43,255,500		5,441,796		497,093		473,647		236,825		933,607		418,705
Extra Heavy Labor	Male	600,000	580	127,020	55	12,045	30	6,570	15	3,285	60	13,140	35	7,665
	Famale	75,000	450	12,319	45	1,232	30	821	15	411	60	1,642	35	958
Heavy Lebor	Male	7,800,000	450	1,281,150	45	128,115	30	85,410	15	42,705	60	170,820	30	85,410
	Famale	2,500,000	400	365,000	45	41,062	30	27,375	15	13,688	60	54,750	30	27,375
Old Pecple(over 60)	Mele	1,494,800	320	174,593	25	13,640	30	16,368	15	8,184	60	32,736	25	13,640
	Female	1,947,500	300	213,251	25	17,771	30	21,325	15	10,663	60	42,650	25	17,771
Childran	Yaars, 0-2	2,890,000	130	137,130	20	21,097	30	31,646	15	15,823	60	63,291	25	26,371
	3-5	2,929,000	175	187,090	20	21,382	30	32,072	15	16,036	60	64,145	25	26,727
	6-7	1,928,000	250	175,930	20	14,074	30	21,112	15	10,556	60	42,223	25	17,593
Adolescents	About 12-17	5,811,766	400	848,518	25	53,032	30	63,639	15	31,819	60	127,278	25	53,033
Normal Consumers and Armed Forces in Japan		15,279,434	344	1,919,795	31	173,643	30	167,309	15	83,655	58	320,932	26	142,162
FARM POPULATION		28,744,500		3,577,332		681,963		346,734		178,360		2,360,642		734,422
Children	Yaers, 0-7	5,610,000	180	368,577	65	133,097	25	51,191	17	34,810	225	460,721	70	143,336
All Othere, Male and Female		23,134,500	380	3,208,755	65	548,866	35	295,543	17	143,550	225	1,899,921	70	591,086
Total Human Consumption (excl. allowance for rice sub.)				9,019,128		1,179,056		820,381		415,185		3,294,249		1,153,127
Substitutes in rice rations				- 527,741		200,000		125,619				507,751		505,873
Total Human Consumption				8,491,387		1,379,056		946,000		415,185		3,802,000		1,659,000
Non-food Uses Including Seed and Waete				1,321,000		1,062,000		222,000		96,000		598,000		366,000
Total Disappeerance				9,812,387		2,441,056		1,168,000		511,185		4,400,000		2,025,000
Home Production				9,197,000		2,627,000		400,000		289,000		4,400,000		2,025,000
Net Imports(+) or Exports (-)				+1,747,000		+ 50,000		+920,000		+225,000		-----		-----
Current Addition to Supplies				10,944,000		2,677,000		1,320,000		514,000		4,400,000		2,025,000
Movement of Stocks 2/				+1,131,613		+ 235,944		+ 152,000		+ 2,815		-----		-----

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1/ Including special allowances and extra-legal consumption, but no allowances for rice substitutes.

2/ Refers solely to increases and decreases in stocks, not to actual levels.

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Table ~~28~~-II. FOOD BALANCE OF JAPAN 1943-44
OTHER FOODSTUFFS OF VEGETABLE ORIGIN

		Population in Group	7 VEGETABLES Daily per Capita Consumption 1/ Grams	Total per Annum MT	8 SEAWEEDS Daily per Capita Consumption 1/ Grams	Total per Annum MT	9 FRUIT Daily per Capita Consumption 1/ Grams	Total per Annum MT	10 SUGAR Daily per Capita Consumption 1/ Grams	Total per Annum MT	11 OILS Daily per Capita Consumption 1/ Grams	Total per Annum MT
NON-FARM POPULATION		43,255,500		1,921,044		315,765		397,268		442,617		65,286
Extra Heavy Labor	Male	600,000	115	25,185	20	4,380	15	3,285	28	6,132	4.5	985
	Female	75,000	115	3,148	20	547	15	411	28	766	4.5	123
Heavy Labor	Male	7,800,000	115	327,405	20	56,940	15	42,705	28	79,716	4.5	12,808
	Female	2,500,000	115	104,938	20	18,250	15	13,688	28	25,550	4.5	4,105
Old People (over 60)	Male	1,494,800	115	62,744	20	10,912	15	8,184	28	15,277	4	2,182
	Female	1,947,500	115	81,746	20	14,217	15	10,663	28	19,903	4	2,843
Children	Years, 0-2	2,890,000	115	121,308	20	21,097	45	47,468	28	29,536	4	4,219
	3-5	2,929,000	115	122,945	20	21,382	45	48,109	28	29,934	4	4,276
	6-7	1,928,000	115	80,928	20	14,074	45	31,667	28	19,704	4	2,815
Adolescents	About 12-17	5,811,766	115	243,949	20	42,426	25	53,032	28	59,396	4	8,485
Normal Consumers and Armed Forces in Japan		15,279,434	134	746,748	20	111,540	25	138,056	28	156,703	4	22,445
FARM POPULATION		28,744,500		2,727,853		209,835		461,637		293,769		41,967
Children	Years, 0-7	5,610,000	260	532,389	20	40,953	44	90,097	28	57,334	4	8,191
All Others, Male and Female		23,134,500	260	2,195,464	20	168,882	44	371,540	28	236,435	4	33,776
Total Human Consumption				4,648,897		525,600		858,905		736,386		107,253
Non-food Uses Including Seed and Waste				850,000				240,000		24,000		1,083
Total Disappearance				5,498,897		525,600		1,098,905		760,386		108,336
Home Production				5,500,000		525,000		1,000,000		136,000		40,000
Net Imports (+) or Exports (-)				------		------		+100,000		+814,000		+ 70,000
Current Addition to Surplies				5,500,000		525,000		1,100,000		950,000		110,000
Movement of Stocks 2/				+ 1,103		- 600		+1,095		+189,614		+1,664

1/ Including special allowances and extra-legal consumption.

2/ Refers solely to increases and decreases in stocks, not to actual levels.

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Table ~~28~~-III. FOOD BALANCE OF JAPAN 1943-44
FOODSTUFFS OF ANIMAL ORIGIN

		Population in Group	12 FISH Daily per Capita Consumption 1/ Grams	12 FISH Total per Annum MT	13 MEAT Daily per Capita Consumption 1/ Grams	13 MEAT Total per Annum MT	14 EGGS Daily per Capita Consumption 1/ Grams	14 EGGS Total per Annum MT	15 MILK Daily per Capita Consumption 1/ Grams	15 MILK Total per Annum MT	16 DAIRY PRODUCTS Daily per Capita Consumption 1/ Grams	16 DAIRY PRODUCTS Total per Annum MT
NON-FARM POPULATION		43,255,500		791,603		74,387		63,152		78,174		15,788
Extra Heavy Labor	Male	600,000	50	10,950	3.8	832	4	876	2.8	613	1	219
	Female	75,000	50	1,369	3.8	104	4	110	2.8	77	1	27
Heavy Labor	Male	7,800,000	50	142,350	3.8	10,819	4	11,388	2.8	7,972	1	2,847
	Female	2,500,000	50	45,625	3.8	3,468	4	3,650	2.8	2,555	1	912
Old People(over 60)	Male	1,494,800	50	27,280	3	1,637	4	2,182	2.8	1,528	1	546
	Female	1,947,500	50	35,542	3	2,132	4	2,843	2.8	1,990	1	711
Children	Years, 0-2	2,890,000	50	52,742	3	3,165	4	4,219	35	36,920	1	1,055
	3-5	2,929,000	50	53,454	3	3,207	4	4,276	2.8	2,993	1	1,069
	6-7	1,928,000	50	35,186	3	2,111	4	2,815	2.8	1,970	1	704
Adolescents	About 12-17	5,811,766	50	106,065	3	6,364	4	8,485	2.8	5,940	1	2,121
Normal Consumers and Armed Forces in Japan		15,279,434	50	281,040	7	40,548	4	22,308	2.8	15,616	1	5,577
FARM POPULATION		28,744,500		419,670		20,983		121,806		52,928		3,162
Children	Years, 0-7	5,610,000	40	81,906	2	4,095	10	20,477	14.3	29,284	0.3	617
All Others, Male and Female		23,134,500	40	337,764	2	16,888	12	101,329	2.8	23,644	0.3	2,545
Total Human Consumption				1,211,273		95,370		184,958		131,102		18,950
Non-food Uses Including Seed and Waste				920,000		42,000		21,000				
Total Disappearance				2,131,273		137,370		205,958		131,102		18,950
Home Production				2,210,000		125,000		206,000		132,000		20,000
Net Imports (+) or Exports (−)				+ 200,000		+ 15,000		-----		-----		-----
Current Addition to Supplies				2,410,000		140,000		206,000		132,000		20,000
Movement of Stocks 2/				+ 278,727		+ 2,630		+ 42		+ 898		+ 1,050

1/ Including special allowances and extra-legal consumption.

2/ Refers solely to increases and decreases in stocks, not to actual levels.

Pre-war food surpluses and deficits of the various regions and prefectures are presented in Table 27 and in the map on page 63. Column 2 shows the total surplus (+) or deficit (−) of each area in terms of calories per capita per day. These estimates represent the difference between the indigenous production of ultimate food energy (after deductions for seed, waste and non-food uses),and average caloric intake. The latter is known only for Japan as a whole; data by prefectures are not available. It is reasonable to assume, nevertheless, that regional differences in average caloric intake are slight and may be neglected.[1]

In Table 27, column 3, the average daily per capita caloric surpluses and deficits have been converted to aggregate annual surpluses and deficits, expressed in terms of their rice equivalents. Since rice is the staple food and could be used for at least short periods to make up for most of the deficits, this gives some approximation of the feeding problem in each area if usual import sources were cut off. It does not of course take account of local stocks or of the sharp cuts in food consumption which might be made for brief emergency periods. The principal surplus products of the various areas are listed in column 4.

As might be expected the most serious food deficits are found in the urban areas of the central industrial belt extending from Fukuoka in Kyushu east along the southern shore of Honshu to Tokyo. In this belt, the prefecture of Fukuoka, the prefecture of Hiroshima, the Osaka-Kobe-Kyoto area

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[1] Seventeen products were used in the calculation of surpluses and deficits; rice, wheat, barley, naked barley, other grains, soybeans, other beans, sweet potatoes, Irish potatoes, vegetables, fruits, sugar, fish (coastal and deep-sea), meat, eggs, milk, and dairy products. The total caloric value of these products was raised by five percent in each prefecture to allow for products not covered (oils, whale meat, aquicultural products and others).

(prefectures of Osaka, Hyogo, Kyoto, and Wakayama), the prefectures of Aichi (with the city of Nagoya), Nagano and Yamanashi, and the Tokyo-Yokohama area (prefectures of Tokyo and Kanagawa) all show deficits in excess of 700 calories per capita per day, and ranging up to 2,000 calories.

The most important food surplus areas are in southern and central Kyushu (prefectures of Kagoshima, Kumamoto, Miyazaki, Saga, and the southern portion of Fukuoka); the prefectures of Kagawa and Okayama on opposite shores of the Inland Sea, the prefecture of Shiga, adjacent to Kyoto; a seventy mile semi-circle to the north and east of Tokyo (including the prefectures of Saitama, Chiba, Ibaraki, most of Tochigi and a part of Gumma); the agricultural belt facing the Sea of Japan along the northwestern shore of Honshu, (prefectures of Ishikawa, Toyama, Niigata, Yamagata, and Akita); the northeastern prefecture of Miyagi, and the island of Hokkaido. These prefectures produce surpluses equivalent to from one hundred to 1,000 calories per head per day. In aggregate terms, surpluses available for use outside the prefecture are greatest in Hokkaido, Chiba, and Ibaraki.

Of the remaining prefectures, those in Kyushu and most of those in the western arm of Honshu or in northern Honshu (Nagasaki, Oita, Yamaguchi, Tottori, Fukui, Iwate, and Aomori) are approximately self-sufficient. Other prefectures in Shikoku and Honshu (Ehime, Kochi, Tokushima, Nara, Mie, Gifu, Shizuoka, Gumma, and Fukushima) have moderate food deficits, ranging from two hundred to six hundred calories per head per day.

Table 27. FOOD SURPLUSES AND DEFICITS[1] IN JAPAN PROPER BY PREFECTURES
COMBINED AVERAGES (1935, 1937, 1939 OF ALL FOOD PRODUCTS
AVAILABLE FOR CONSUMPTION[2]

Region or Prefecture	Average daily per capita caloric surpluses or deficits (calories)	Aggregate annual caloric surpluses or deficits of all foods expressed in rice equivalent (000 m.t.)	Principal surplus products[3]
ushu			
Kagoshima	+ 450	+ 74	SP,
Miyazaki	+ 130	+ 11	SP
Kumamoto	+ 469	+ 65	R,W,NB,SP
Oita	- 14	- 1	R,W,NB,FR
Fukuoka	- 728	- 207	W
Saga	+ 928	+ 65	R,W
Nagasaki	- 158	- 22	NB,SP,F
ikoku			
Kochi	- 454	- 33	
Ehime	- 342	- 38	NB,FR
Tokushima	- 500	- 38	NB
Kagawa	+ 198	+ 16	W,NB
ugoku			
Yamagushi	- 123	- 16	F
Hiroshima	- 845	- 158	
Shimane	- 296	- 22	R
Okayama	+ 127	+ 16	R,W
Tottori	- 81	- 4	R
nki			
Hyogo	- 1,004	- 305	
Osaka	- 1,769	- 822	
Wakayama	- 695	- 60	FR
Nara	- 346	- 22	
Kyoto	- 1,378	- 245	
Fukui	- 48	- 3	
Shiga	+ 460	+ 33	R
kaido			
Ishikawa	+ 215	+ 16	F
Toyama	+ 668	+ 54	R
Gifu	- 448	- 54	
Mie	- 274	- 33	R
Aichi	- 894	- 267	
Shizuoka	- 559	- 114	SP,FR,F

Table 27. (Continued)

Region or Prefecture	Average daily per capita caloric surpluses or deficits (calories)	Aggregate annual caloric surpluses or deficits of all foods expressed in rice equivalent (000 m.t.)	Principal surplus products[3]
Kanto			
Nagano	- 724	- 125	
Yamanashi	- 811	- 54	B
Kanagawa	- 1,344	- 261	
Tokyo	- 1,965	- 1,355	
Saitama	+ 96	+ 16	W,B,SP,V
Gumma	- 381	- 49	W,B
Chiba	+ 1,038	+ 174	W,B,SP,F,V
Ibaraki	+ 915	+ 147	R,W,B,SP,F,V
Tochigi	+ 280	+ 33	W,B
Niigata	+ 307	+ 65	R
Tohoku			
Fukushima	- 210	- 33	B
Miyagi	+ 250	+ 33	R,B,F
Yamagata	+ 231	+ 27	R
Iwate	+ 24	+ 3	SB,F,B
Akita	+ 325	+ 3	R
Aomori	- 43	- 4	FR,F
Hokkaido	+ 879	+ 285	MG,SB,OB, IP,F,M,DP

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1. Surpluses and deficits are defined as the difference between (1) the aggregate caloric value of crops and other commodity production available for food in each prefecture (i.e., after deductions for non-food use -- feed, seed, milling, offals, waste in distribution and industrial uses -- calculated on a uniform percentage basis for each prefecture's production) and (2) aggregate caloric consumption (calculated on a uniform basis of 2270 calories per capita per day in each prefecture).
2. Including 17 products: rice, wheat, barley, naked barley, other grains, soybeans, other beans, sweet potatoes, Irish potatoes, sugar, vegetables, fruit, fish (coastal and deep-sea), meat, eggs, milk and dairy products. The total caloric value of these products was raised by five percent in each prefecture to allow for food products not covered (oils, whale meat, aquicultural products and others).
3. Calculated as indicated in note (1), but for a single product. The surplus actually shipped out may be greater or less than the calculated figure, depending on differences among prefectures in consumption of particular foods.

R-rice, W-wheat, B-barley, NB-naked barley, MG-minor grains, SB-soybeans, OB-other beans, SP-sweet potatoes, IP-Irish potatoes, V-vegetables, FR-fruits, F-fish, S-sugar, M-milk, DP-dairy products.

V. CHANGES IN 1944-45

The 1944 rice crop in Japan fell probably 200,000 to 300,000 metric tons short of nine million metric tons. [1] The total domestic output of ultimate food energy may have declined from two to four percent compared with 1943. [2] In addition, total imports in 1944-45 are expected to decline by about twenty percent; rice imports by one-third. [3] Table 28 lists production and imports. Imports would account for about fifteen percent of the total food supply.

The estimates for 1944-1945 food imports assume that a high-to-middling priority is given to transportation of foodstuffs for the purpose of maintaining reserve stocks in Japan in the face of an almost certain decline in production in 1945, a probable further decline in 1946, and possible partial destruction of existing stocks in bombings of Japanese cities. Supplies believed to be obtainable on the continent are large enough to allow considerably greater rice imports than estimated -- particularly from China -- if food imports were given top priority. However, the estimates for other commodities already allow for importation of virtually

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[1] On 29 January 1945, Director Yukawa of the Food Administration Bureau of the Ministry of Agriculture and Commerce, in a speech before the House Budget Sub-Committee, declared that the 1944 rice crop would be below the normal level of 61-62 million koku. Inasmuch as early crop estimates as a rule proved to be over-optimistic in the past, and were revised downward as the season advanced, it is assumed that this year's crop will be five percent below 1943.

[2] Official reports of January and February 1945 admit a decline in total acreage and production. Increases are reported only for sweet potatoes, and for wheat and barley. Yukawa put the production of these grains at 24-25 million koku. This estimate seems to be high. It is assumed that actual production probably did not increase more than ten percent over 1943.

[3] Owing to the shipping situation and the developments in the Pacific, Japan had to cut down on imports from Formosa and French Indochina. Soybean imports from Manchuria, however, seem to have increased greatly.

all available surpluses with the possible exception of wheat from China.

Except for sugar, [1] rations this year are approximately unchanged.[2] There is, however, substantial evidence that owing to difficulties in transportation and distribution, rations frequently have not been fully honored in the larger urban centers. On the other hand, there are signs of a weakening of distribution controls, especially for foodstuffs other than rice, so that illegal consumption has probably increased. Rationed and extra-legal consumption combined are estimated to be about the same in 1943-44. Japan's requirements could be approximately covered from current production and imports, so that carry-over stocks would not have to be drawn upon. It is worth noting, however, that this is probably the first year since 1938-39 in which there appears to be no significant increase in carry-over of rice.[3]

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1. The basic sugar ration has been reduced by about seventy-five percent.
2. The Japanese Minister of Agriculture, Shimada, declared before the Diet that the present rice rations would be maintained in 1945.
Hamburger Fremdenblatt, 30 January 1945
3. See Table 25. Assuming a high level of imports and effective controls (Assumption A), stocks would increase by about 600,000 metric tons. Under the minimum assumption (Assumption B), stocks would decline by 400,000 metric tons. The "most likely estimate" (Average of A and B) indicates a slight increase in stocks of 100,000 metric tons.

Table 28. ESTIMATED PRODUCTION AND IMPORTS OF MAJOR FOODSTUFFS IN JAPAN PROPER 1944 - 1945 1/

(000 metric tons)

	Production	Imports
Rice	8737[2]	1100
Wheat	1222[3]	
Barley	650[3]	
Naked Barley	728[3]	
Minor Grains	240	
Soybeans	380[2]	1485
Other Beans	275[2]	225
Sweet Potatoes	4620[4]	
Irish Potatoes	1964[5]	
Vegetables	5500	
Fruits	900[6]	
Sugar	165[7]	550
Fish	1750[8]	175
Meat	120	
Eggs	200	
Milk	130	
Dairy Products	19	

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1. The methods and sources used in deriving the estimates presented in this table are explained in the text.
2. Assuming a decrease of 5% from 1943 production.
3. Total crop of wheat and barley is estimated at 2.6 million metric tons, an increase of about 10% over the 1943 crop. The percentage distribution (wheat 47%, barley 25%, and naked barley 28%) is based on data for 1935, 1937, 1939, adjusted for war time changes.
4. Assuming an increase of 5% over 1943.
5. Assuming a decrease of 3% from 1943.
6. Assuming a decrease of 10% from 1943.
7. 120,000 metric tons of cane sugar and 45,000 metric tons of beet sugar(in Hokkaido).
8. Assuming a decrease of over 40% from prewar catch.

VI. PROSPECTS FOR 1945-46

In view of the increasing shortage of fertilizer and other input factors, it is believed that with normal weather conditions, Japan's total domestic production of food energy in 1945 will decline by at least five percent compared with 1944, or to about 1670 calories per capita per day.[1] With average per capita consumption at the rate of 2000 calories[2], the deficit would amount to 330 calories per capita per day. The total annual deficit expressed in terms of brown rice equivalent amounts to 2,700,000 metric tons.

Excluding the new harvest, total stocks at the beginning of the crop year 1945-46, expressed as brown-rice equivalents, may be as follows:

Rice	5,230,000	metric	tons	brown	rice	basis
Sugar	560,000	"	"	brown	rice	equivalent
Wheat and Barley	250,000	"	"	"	"	"
Soybeans	150,000	"	"	"	"	"
Fish	90,000	"	"	"	"	"
	6,280,000	"	"	"	"	"

About 2,000,000 metric tons of this represent normal distribution stocks ("pipe line" stocks) necessary to bridge the gap between two harvests and to cushion the effect of irregularities in the flow of supplies. The balance, representing excess stocks, is equal to 1.6 times the estimated annual

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[1] Assuming no change in resident population.

[2] I.e., 50 calories less than in 1943-44.

deficit at prospective 1945 production levels and an average daily per capita intake of 2000 calories. It would appear, then, that Japan could withstand an effective blockade for almost 2 years with only a slight decline in consumption below present levels. A somewhat greater reduction of consumption would make it possible for Japan to bridge two harvests. It should be kept in mind, however, that the estimate of stocks is subject to a large cumulative error, and "excess stocks" may actually be only half as large as indicated above. Even under this assumption, Japan would seem to be able to carry on for about 1 year without imports.

These conclusions must be accepted with great caution for several reasons: (1) No direct evidence as to the size of reserve stocks is available. (2) Japan's agriculture is exceptionally vulnerable because of its great dependence upon a large input of nitrogenous fertilizer. If nitrogen production or distribution has been significantly disrupted, yields in 1945 might decline by more than five percent. (3) Stocks may be lost by spoilage and bombing, and transportation and distribution may deteriorate further so that the food supply in the cities may decline while stocks are hoarded in the country. Reports suggesting intensified food shortages in recent months are regarded as indicating a partial break down of transportation and distribution in the larger cities affected by bombings, and possibly also some destruction of food stocks in those cities, rather than a generally tight reserve position in all parts of the country.

The deterioration of wartime controls and the fear of inflation may cause farmers to refuse to market their produce through legal channels and at legal prices. They may be inclined, instead, to increase their own consumption, to hoard surpluses over farm requirements, and to sell or barter food at black market prices. The European experience in World War II has shown that such developments may lead to widespread starvation among some groups of the population, while other groups are comparatively well fed.

APPENDIX A

Methods and Sources Used in this Study

The tentative estimates presented in this report are the result of a comprehensive analysis of the Japanese food position based on two independent approaches: (1) The conventional "supply approach", starting from production and net imports, including an allowance for seed, waste and non-food uses; (2) the "consumption approach", based on a detailed study of rations and special allowances as published in the Japanese press. Both methods are subject to a wide margin of error. In some instances in which quantitative information is lacking completely, gaps had to be closed by analogy and interpolation. Therefore, accuracy in detail can not always be claimed for these estimates. Although both approaches involve elements of uncertainty and judgment, the general picture of supply and ration requirements may be considered as relatively firm in its broad outline.

An attempt at reconciling these two lines of attack reveals, however, a discrepancy which must be attributed essentially to two factors of unknown magnitude: non-rationed and illegal consumption, and movement of stocks. Although quantitative information on these factors is lacking, it is believed that the numerous cross-checks and tests of consistency and plausibility afforded by a complete food balance, broken down according to products (Table 26), effectively minimize errors of judgment. It is hoped that the use of this technique thus lends to the results of this study a degree of validity not possessed by analyses based on the supply position alone.

Production and trade figures for 1935 and 1937 were taken from the Statistical Yearbook of the Japanese Empire, 1937, 1938, 1939 (Nippon Teikoku Tokei Nenkan); those for 1939 from Agricultural Statistics, 1939, (Norinsho Tokeihyo, Showa 14th Year), published by the Japanese Ministry of Agriculture. Wartime estimates are based on Domei broadcasts, Japanese newspaper reports; reports in the Oriental Economist (Toyo Keizai) and in Die Deutsche Volkswirtschaft and miscellaneous intelligence. Wartime estimates of production by prefectures are based on the prewar distribution of production, adjusted for known wartime shifts in the geographic location of agricultural production.

Estimates of wartime consumption are based on reports on rations and extra allowances published in the Japanese press: Mainichi Shimbun, Yomiuri Hochi, Asahi Shimbun (Tokyo), Asahi Shimbun (Osaka), and based in part on FCC reports, and other intelligence, and on estimates of unrationed and illegal consumption. The nominal "rice ration" is uniform for Japan as a whole, but its non-rice components vary both in time and place. Total consumption (including substitutes) is assumed to be equal to the nominal ration, since it is thought that occasional special distributions and illegal sales are approximately offset by occasional failure to meet the ration due to transport and distribution difficulties. Rice consumption on farms[1] was estimated from the difference between production and collections as indicated by the amount of subsidies paid to producers. [2] To this were added small

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[1] Pure rice, no substitutes.

[2] Subsidies on deliveries.

quantities believed to be retained illegally. The amount needed for seed was deducted from the total quantity retained by farmers. The estimate of total sugar consumption includes extra allowances (which are quite substantial), the sugar content of sweets, bakery goods and illegal consumption. The basic sugar ration is only a little over one-third of the estimated total consumption. Other foodstuffs are rationed locally and vary from time to time. Estimates had to be based on newspaper reports of per capita allowances or of food shipments. These reports included information on the number of recipients.

Milk can only be obtained by small children; extra allowances for adults are granted only on a doctor's certificate. Fruits are distributed mainly to children and are only occasionally obtained by adults. The rations of green vegetables seem to be smaller in the large urban centers than in small towns and villages (probably due to transportation difficulties).

APPENDIX B

Nutritional Conversion Factors

The nutritive factors of foods are taken from USDA Circular No. 549, Proximate Composition of American Food Materials, by Charlotte Chatfield and Georgian Adams (see Appendix B, Table 1). Factors for food groups (admixture to rice, minor grains, vegetables, fruit, fish, meat and dairy products) are averages of the nutritive constants of different varieties in each group.

The caloric requirements of different consumer groups used in Table 23 were derived from Food and Nutrition by Ruth Wheeler in collaboration with Helen Wheeler.

Appendix B, Table 1. NUTRITIONAL CONVERSION FACTORS
CALORIES, PROTEINS, FATS, CARBOHYDRATES PER 100 GRAMS OF FOOD

	Calories	Proteins 1/ (grams)	Fats 2/ (grams)	Carbohydrates 3/ (grams)
Rice	356	7.5	1.7	77.7
Admixture to rice (grains, soybean and potato flour)	370	12.5	5.0	68.7
Wheat	355	9.3	1.0	77.2
Barley	357	8.2	1.0	78.8
Naked barley	357	8.2	1.0	78.8
Minor grains	350	8.5	1.0	76.8
Soybeans, dried	350	34.9	18.1	12.0
Other beans, dried	300	20.0	1.8	51.0
Sweet potatoes	108	1.5	0.6	24.1
Irish potatoes	72	1.7	0.1	16.0
Vegetables	35	0.9	0.15	7.5
Seaweeds	10	--	1.1	--
Fruit	50	0.6	0.3	11.2
Sugar	398	--	--	99.5
Fish	125	21.1	4.5	--
Meat	200	18.6	14.0	--
Canned corned beef, medium	209	25.3	12.0	--
Eggs	158	12.8	11.5	0.7
Milk, cow fresh, whole	69	3.5	3.9	4.9
Evaporated milk, unsweetened	139	7.0	7.9	9.9
Condensed milk, sweetened	327	8.1	8.4	54.8
Dried milk, whole	496	25.8	26.7	38.0
Dairy products	300	16.0	24.0	5.0
Butter	733	0.6	81.0	0.4
Oils	900	--	100.0	--

1/ 1 gram of protein provides about 4 calories.
2/ 1 gram of fat provides about 9 calories.
3/ 1 gram of carbohydrates provides about 4 calories.

APPENDIX C

Population by Consumer Groups

The population estimates used in Table 26 were derived as follows: Estimates of resident population: 72,000,000; the estimates for old persons over 60, children and adolescents are based on the age distribution in the 1930 census. A breakdown of the labor groups by industries and consumer groups is shown in Appendix C, Table 1.

All estimates are subject to revision as further information becomes available.

Appendix C, Table 1. TENTATIVE ESTIMATE OF THE DISTRIBUTION OF CONSUMER GROUPS BY INDUSTRIES IN JAPAN, 1944

(000)

Labor Force	Total Labor Force1/			Farm Labor2/		Very Heavy Labor		Heavy Labor		Light Labor3/	
	Total4/	Male	Female	Male	Female	Male	Female5/	Male	Female5/	Male	Female
Agriculture	13,730	5,640	8,090	5,640	8,090						
Fishing	500	430	70					425	60	5	10
Mining	800	670	130			400	10	265	110	5	10
Manufacturing	9,350	7,050	2,300			170	60	5,980	2,020	900	220
Commerce	3,470	1,870	1,600					60	50	1,810	1,550
Transportation & Communication	1,550	1,150	400			30	5	820	210	300	185
Government & Professional	2,300	1,730	570							1,730	570
Domestic	500	30	470							30	470
Miscellaneous	600	500	100					250	50	250	50
TOTAL	32,800	19,070	13,730	5,640	8,090	600	75	7,800	2,500	5,030	3,065

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1. See report on "Industrial Distribution of the Population of Japan", prepared by the Office of Strategic Services, Research and Analysis Branch, R&A No. 2271.
2. Included in the consumer group "Farm population (8 and over)".
3. Included in the "Normal Consumers" category.
4. Based on the occupational distribution in the 1930 census.
5. "Very heavy labor", "heavy labor" and "light labor" are defined differently for men and women. In terms of expenditure of energy "very heavy" work of women is roughly equivalent to "heavy work" performed by men.

JAPAN: FOOD SURPLUSES AND DEFICITS[1]

COMBINED AVERAGES (1935, 1937, 1939) OF ALL FOOD PRODUCTS AVAILABLE FOR CONSUMPTION[2]

RELIABILITY OF DATA

DATA	QUAN.	QUAL.	LOC.
CALORIES PER CAPITA	GR-C	GR-C	A
AGGREGATE CALORIC EQUIVALENT	GR-C	GR-C	A
PRINCIPAL PRODUCTION SURPLUSES	GR-C	GR-C	A

Quantitative & Qualitative Data
R - Reliable
GR - Generally Reliable
U - Unreliable
Coverage of Data
C - Complete
I - Incomplete
Location of Data
A - Accurate
NE - Not Entirely Accurate
OA - Only Approx. Accurate

QUANTITATIVE DATA The letters R, GR, and U are an estimate of the reliability of the map's quantitative data, the data which are measurable, including economic or population statistics, hypsometric data, the width of roads, gauges of railroads, etc.

QUALITATIVE DATA The letters R, GR, and U are an estimate of the reliability of the map's qualitative data which shows the types of road surfaces, character of beaches, types of terrain, etc.

COVERAGE The letters C and I in combination with R, GR, or U are an estimate of the degree of completeness of quantitative and qualitative data.

LOCATIONAL DATA The letters A, NE, and OA are estimates of the plotted accuracy of data within the limits of scale and width of line.

R A, OSS

GLOSSARY
—retto . . . . chain of islands
—shima . . . . island

SURPLUSES AND DEFICITS BY PREFECTURES EXPRESSED IN:

CALORIES PER CAPITA PER DAY

Basis, 2270 calories

- ▥ SURPLUS OVER 1000
- ☰ SURPLUS 600-1000
- ▥ SURPLUS 175-600
- ☐ SURPLUS OR DEFICIT LESS THAN 175
- ░ DEFICIT 175-600
- ▒ DEFICIT 600-1000
- ▓ DEFICIT OVER 1000

AGGREGATE ANNUAL CALORIC EQUIVALENT OF ALL FOODS

In terms of 1000 metric tons of cleaned rice.
Deficit shown in red, surplus in block.

800 · 300 · 200 · 100 · 50 · 10

PRINCIPAL PRODUCTION SURPLUSES OF PARTICULAR PRODUCTS BY PREFECTURES[3]

R	RICE	SB	SOYBEANS	FR	FRUITS
W	WHEAT	OB	OTHER BEANS	F	FISH
B	BARLEY	SP	SWEET POTATOES	S	SUGAR
NB	NAKED BARLEY	IP	IRISH POTATOES	M	MILK
MG	MINOR GRAINS	V	VEGETABLES	DP	DAIRY PRODUCTS

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1 Surpluses and deficits are defined as the difference between (1) the aggregate caloric value of crops and other commodity production available for food in each prefecture (less deduction for non-food uses—feed, seed, milling offals, waste in distribution and industrial uses—calculated on a uniform percentage basis for each prefecture's production) and (2) aggregate caloric consumption (calculated on a uniform basis of 2270 calories per capita per day in each prefecture).

2 Including 17 products: rice, wheat, barley, naked barley, minor grains, soybeans, other beans, sweet potatoes, irish potatoes, sugar, vegetables, fruit, fish (coastal and deep-sea), meat, eggs, milk and dairy products.

3 Calculated as indicated in note (1), but for a single product. The surplus actually shipped out may be greater or less than the calculated figure, depending on differences among prefectures in consumption of particular foods

0 25 50 100 150
MILES
0 25 50 100 150 200
KILOMETERS

NO. 6297—R&A, OSS
27 JUNE 1945

LITHOGRAPHED IN THE REPRODUCTION BRANCH, OSS


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